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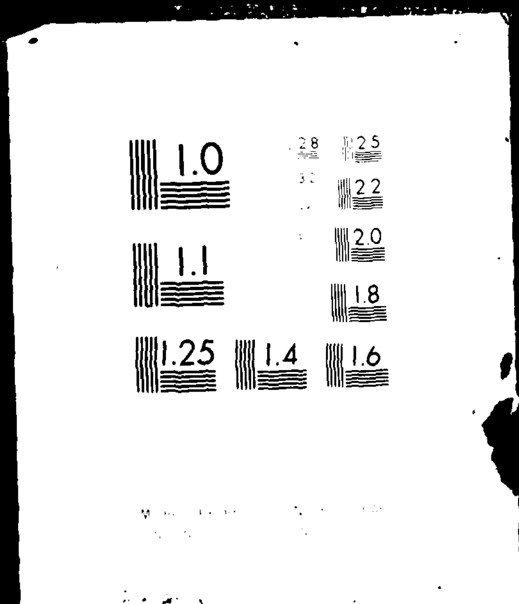

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FIELD SURVEYS, IOC VALLEYS
BIOLOGICAL RESOURCES SURVEY
DRY LAKE VALLEY, NEVADA

VOLUME II PART I

Prepared for:

U.S. Department of the Air Force
Ballistic Missile Office (BMO)
Norton Air Force Base, California 92409

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Results of the biological resources survey of Dry Lake Valley, Nevada revealed two species of plants that are on the Federal list as Taxa Currently Under Review for threatened species. The study area has no sage grouse or tortoise range and little or no riparian or wetland area. The northwestern portion of the valley lies within the winter mule deer range.

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FOREWORD

This report was prepared for the Department of the Air Force, Ballistic Missile Office (BMO), in compliance with Contract No. F04704-80-C-0006, Task 4.5. The report, in three volumes, describes and evaluates procedures for shelter layouts and field studies consisting of land and environmental surveys and geotechnical inspections of sites and some road corridors in the IOC valleys.

Volume I presents an overview of the program, evaluates the procedures and summarizes the findings in Dry Lake Valley, Nevada, and Pine and Wah Wah valleys, Utah. Volume II describes the biological resources of the area and is divided into this volume, Part I-Dry Lake Valley, and Part II-Pine and Wah Wah valleys. Volume III describes the cultural resources and is similarly divided.

Changes to the baseline criteria and requirements made during the field surveys include:

- o Deletion of the Remote Surveillance Sites (RSSs) as of 12 March 1981;
- o Major rerouting of the Designated Transportation Network (DTN) in northern Wah Wah Valley; and
- o Modification of the road pattern from straight-line to direct-connect.

No shelter relocations or reorientations were made as a result of the baseline change from straight-line cluster roads to direct-connect roads. Recent layout studies indicate that shelter sites investigated for the study can be used for the direct connect concept, however, the orientation of some shelters could be improved if new direct connect layouts were performed. It is expected that most or all of the CMF sites will have to be relocated for the direct-connect concept.

Additional studies are planned as part of the IOC program. These include:

- o Consultations with Utah and Nevada State Historic Preservation Offices (SHPO) to evaluate significance of sites in the IOC valleys and their potential for inclusion in the National Register of Historic Places;
- o determination of project effects on significant cultural resources;
- o development of possible cultural resource mitigation measures; and

- Native American consultations.

The results of these additional tasks will be incorporated in revisions of Volume III of this report and in a supplemental report which will be complete during FY 82.

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LIST OF EQUATIONS

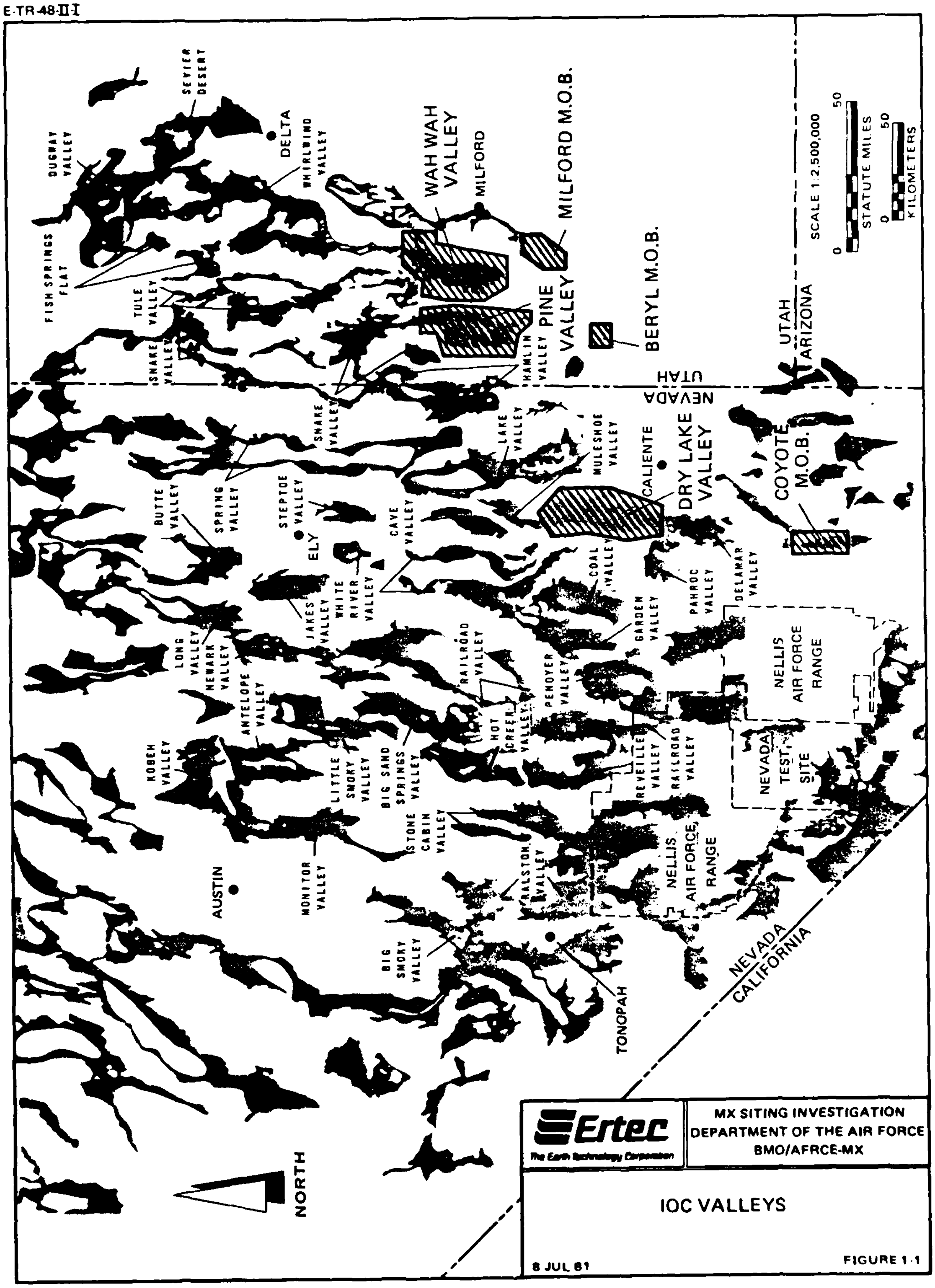
1.0 INTRODUCTION

1.1 BACKGROUND

In April and May of 1980, the AFRCE proposed to initiate field studies in selected Nevada and Utah valleys for the purposes of testing cluster layout procedures and determining potential field problems in actual shelter siting. Dry Lake, Nevada, was selected because it was large enough to support 10 clusters and was relatively close to the proposed Operational Base (OB) site in Coyote Spring Valley. Pine and Wah Wah valleys, Utah, were selected because they were the closest valleys to proposed OB sites near the towns of Beryl and Milford and, together, could support 10 clusters (Figure 1-1).

According to present Air Force plans, there is to be an Initial Operational Capability (IOC) of 10 clusters by mid-1986. There is a high likelihood that shelter construction would start either in Dry Lake Valley, Nevada, or Pine and Wah Wah valleys, Utah, to meet the IOC schedule. For this reason, the present program is referred to as field surveys, IOC valleys.

The intent of the IOC field surveys program was to support the development of the siting methodology and the land withdrawal application being submitted to Congress by the U.S. Air Force. The land withdrawal package must include a legal description of federal lands to be withdrawn for MX. The field program for the IOC valleys was developed after consultations with AFRCE-MX and Utah and Nevada state offices of the Bureau of Land Management (BLM).



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IOC VALLEYS

8 JUL 81

FIGURE 1-1

1.2 OBJECTIVES

The primary objectives of the IOC field surveys were to:

- o Identify problems associated with siting criteria or layout procedures by actually locating Horizontal Shelter Sites (HSSs), Cluster Maintenance Facilities (CMFs) and Remote Surveillance Sites (RSSs) in the field;

- o Assess environmental and geotechnical conditions at the shelter, CMF, and RSS sites and along a few road corridors and determine what changes are needed to minimize impacts;

- o Develop a methodology for performing field surveys in the Designated Deployment Area (DDA); and

- o Provide legal descriptions of surveyed sites for the land withdrawal application.

The elements of the program are as follows:

- o Complete shelter layouts for Dry Lake, Pine, and Wah Wah valleys at a scale of 1:62,500 showing all shelter, CMF, and RSS sites (Figures 1-2, 1-3 and 1-4).

- o Submit layouts to BMO/AFRCE for review. Modify the layouts, if needed, in accordance with review comments.

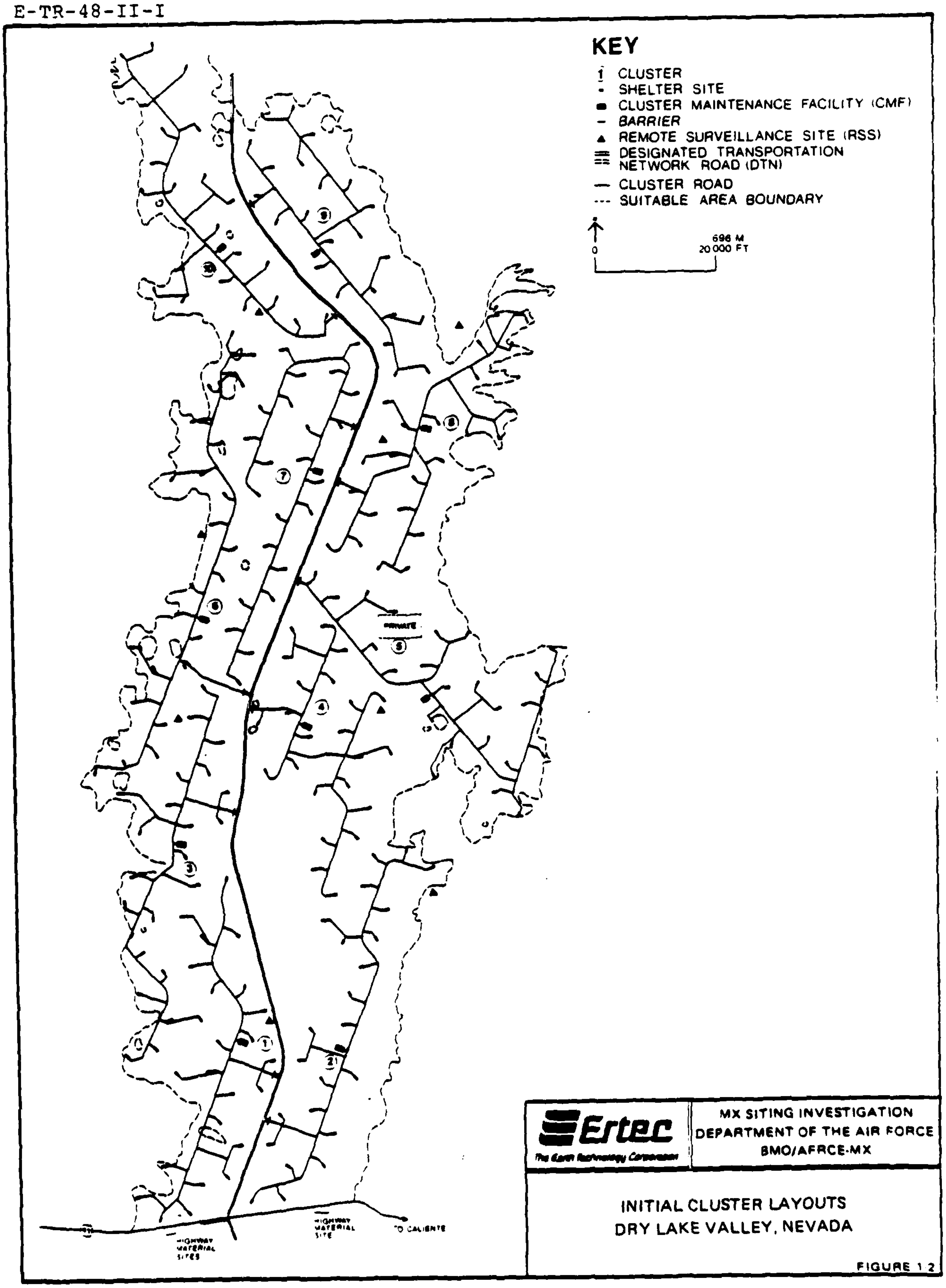
- o Transfer the layout to 1:9600 scale topographic maps. Adjust site locations, if necessary, to avoid drainages and other features that can be identified on the drawings at this scale.

- o Determine the state plane coordinates and bearings of all structures. In Dry Lake Valley, determine the coordinates of points of intersection of the Designated Transportation Network (DTN) and Cluster 2 roads. Provide the land surveyors with these data.

- o Perform field surveys to locate and monument each site and stake the centerline of the DTN and Cluster 2 roads in Dry Lake Valley.

- o Perform geotechnical inspection of sites to determine if they are located in suitable area and to evaluate site-specific geotechnical and terrain conditions. Based on evaluations, recommend which sites should be relocated.

- o Inventory cultural resources including prehistoric and historical artifacts and sites and determine which resources may be adversely affected by project construction. Based on consultation with Bureau of Land Management archeologists,



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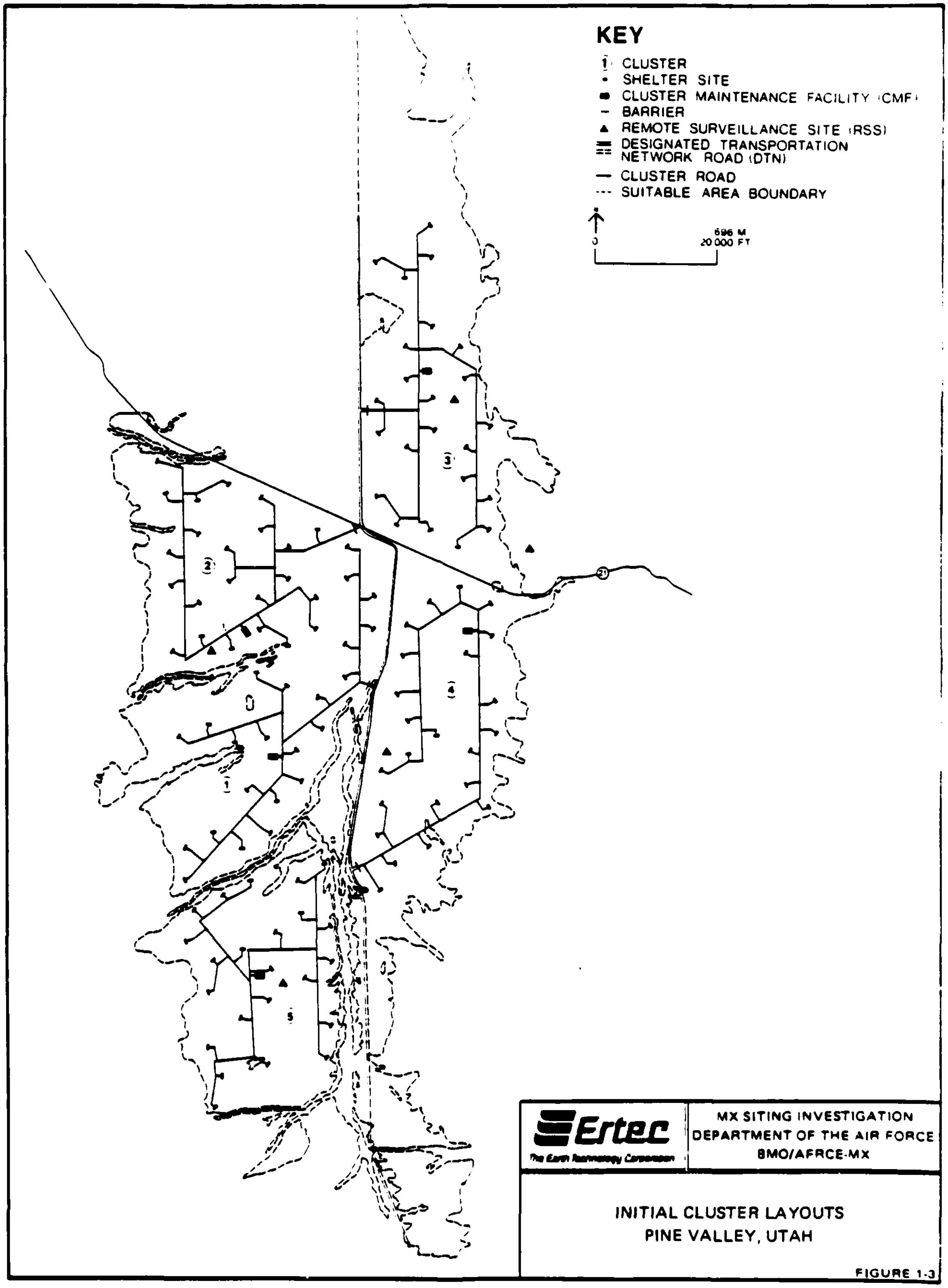
INITIAL CLUSTER LAYOUTS
DRY LAKE VALLEY, NEVADA

FIGURE 1.2



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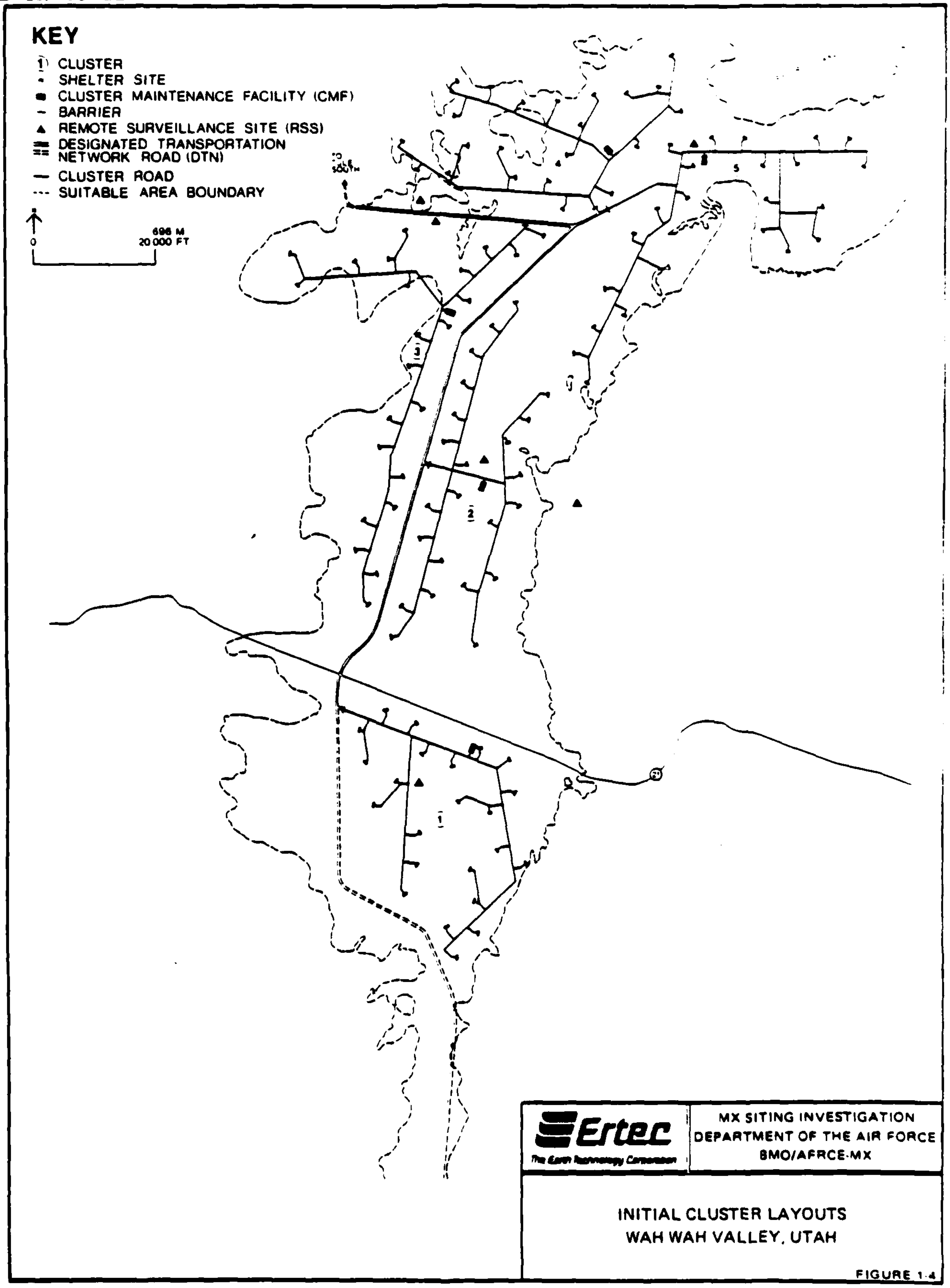
INITIAL CLUSTER LAYOUTS
PINE VALLEY, UTAH

FIGURE 1-3



INITIAL CLUSTER LAYOUTS
WAH WAH VALLEY, UTAH

FIGURE 1-4

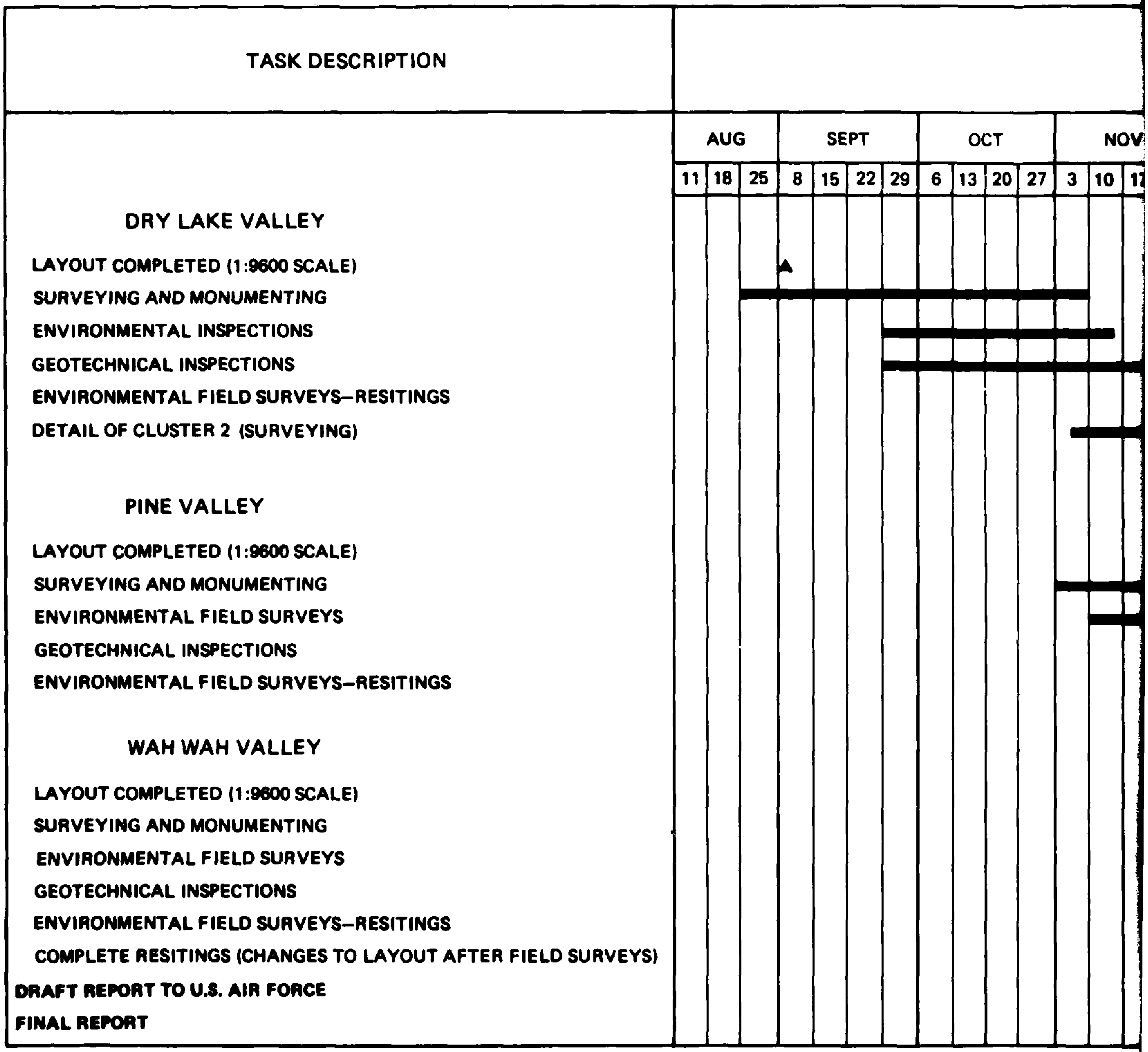
make recommendations to mitigate adverse effects on resources eligible for the National Register of Historic Places or considered significant for other reasons.

- o Perform biological field surveys to determine the location of sensitive, threatened, and endangered plant and wildlife species that may be adversely affected by project construction. Recommend mitigative measures, when possible, based upon consultation with personnel from state and federal agencies.
- o Submit recommendations to BMO/AFRCE for field and office review. After final decisions have been made regarding the number of sites to be relocated, layouts are revised, new coordinates are generated, sites are resurveyed, and monumented, and environmental surveys are completed.
- o Prepare legal descriptions of the land at each site that will be withdrawn from public use.
- o Prepare an environmental report and general report of the program.

The layouts for Dry Lake, Pine, and Wah Wah valleys, at a scale of 1:9600, were completed 8 September 1980, 25 November 1980, and 8 January 1981, respectively. Locating existing survey controls and establishing a control grid over Dry Lake Valley began on 28 August 1980; surveying and monumenting shelter sites began shortly thereafter. The cultural resources and biological field surveys and geotechnical inspections began 29 September 1980 in Dry Lake Valley and were completed for all valleys on 15 March 1981. An effort was made to complete as much field work as possible by December 1980 knowing there would be delays in the winter months because of weather conditions. A completed schedule is shown in Figure 1-5.

1.3 REPORT ORGANIZATION

This report presents a description of the data and techniques used to derive shelter layouts. Valley specific information and results of the field surveys for the three IOC valleys are


TASK DESCRIPTION
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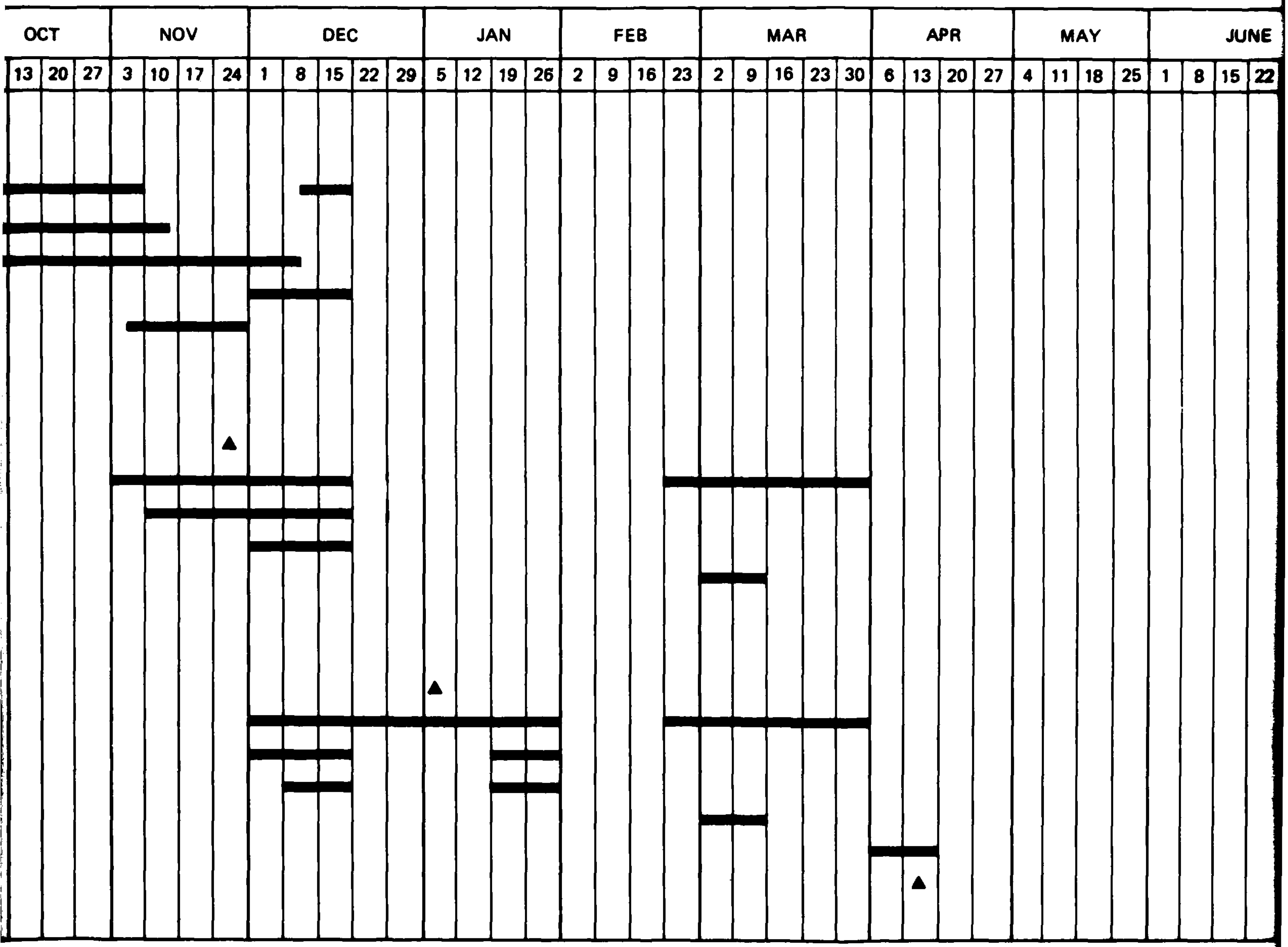
DRY LAKE VALLEY
LAYOUT COMPLETED (1:9600 SCALE)
SURVEYING AND MONUMENTING
ENVIRONMENTAL INSPECTIONS
GEOTECHNICAL INSPECTIONS
ENVIRONMENTAL FIELD SURVEYS–RESITINGS
DETAIL OF CLUSTER 2 (SURVEYING)
PINE VALLEY
LAYOUT COMPLETED (1:9600 SCALE)
SURVEYING AND MONUMENTING
ENVIRONMENTAL FIELD SURVEYS
GEOTECHNICAL INSPECTIONS
ENVIRONMENTAL FIELD SURVEYS–RESITINGS
WAH WAH VALLEY
LAYOUT COMPLETED (1:9600 SCALE)
SURVEYING AND MONUMENTING
ENVIRONMENTAL FIELD SURVEYS
GEOTECHNICAL INSPECTIONS
ENVIRONMENTAL FIELD SURVEYS–RESITINGS
COMPLETE RESITINGS (CHANGES TO LAYOUT AFTER FIELD SURVEYS)
DRAFT REPORT TO U.S. AIR FORCE
FINAL REPORT

TIME SCHEDULE



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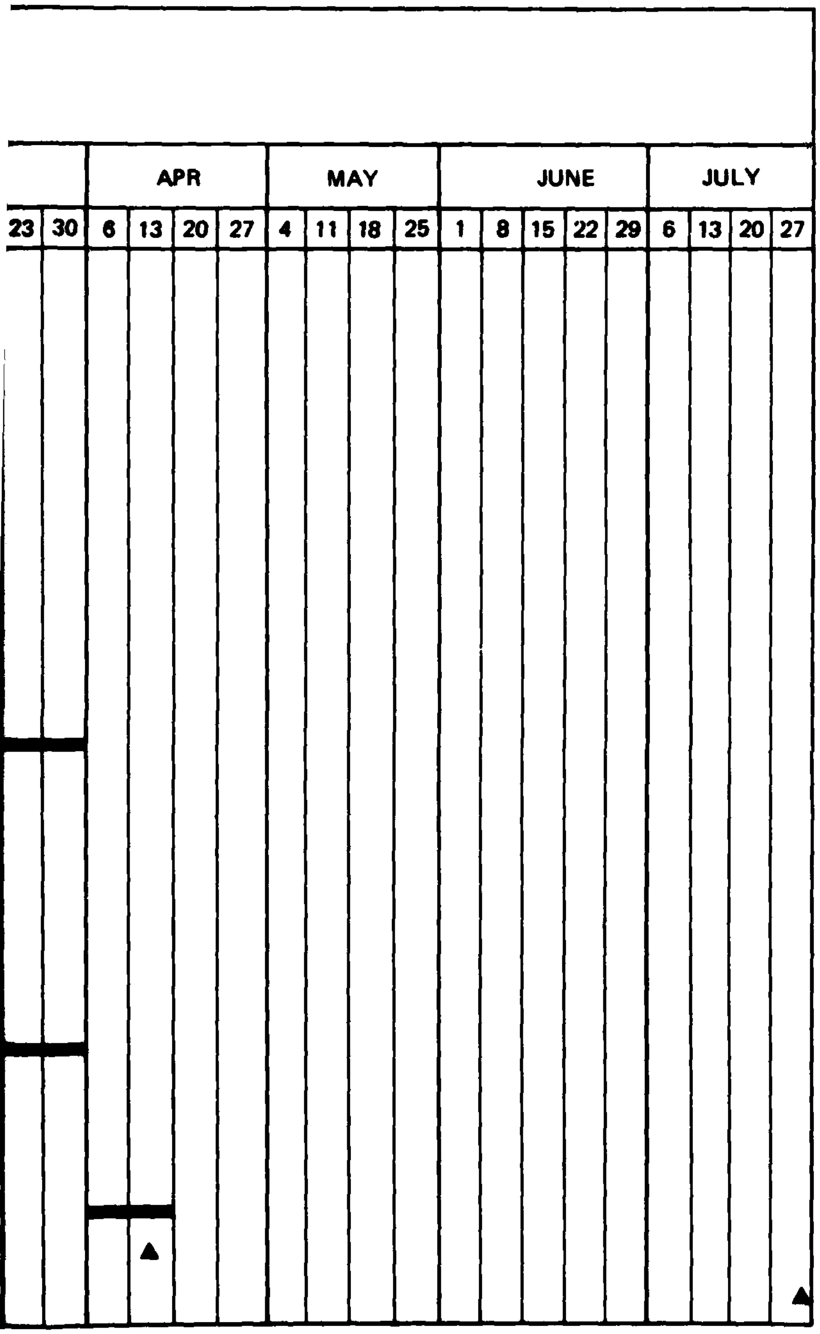
SCHEDULE

NOTE: FIGURE 1-5 SAMES AS 1-2 IN VOL. I



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SCHEDULE OF FIELD SURVEYS

FIGURE 1-5

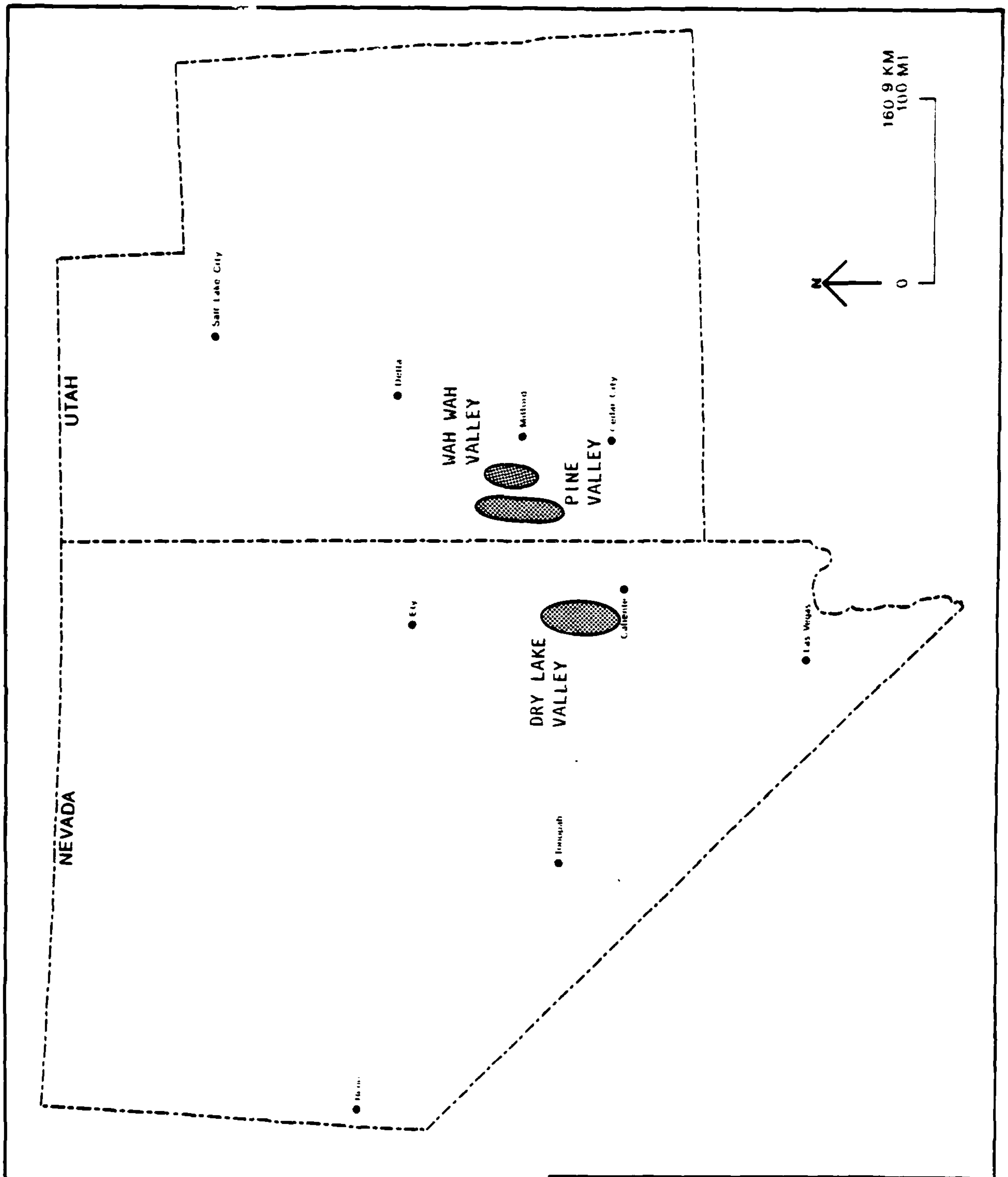
...URE 1-5 SAMES AS 1-2 IN VOL. I

summarized. An evaluation of the methods and techniques forms the basis for recommended program and method changes.

The report consists of three volumes. Volumes II and III contain two parts which are bound separately. The contents of each volume are as follows:

Volume I - Program Overview and Methodology;
Volume II, Part I - Biological Resources, Dry Lake Valley, Nevada;
Volume II, Part II - Biological Resources, Pine and Wah Wah valleys, Utah;
Volume III, Part I - Cultural Resources, Dry Lake Valley, Nevada; and
Volume III, Part II - Cultural Resources, Pine and Wah Wah valleys, Utah.

This volume (Volume II, Part I) presents the methodology and results of biological resources surveys of 10 CMFs, 5 RSSs, 230 HSSs, and 24 resitings in the Dry Lake Valley Study Area (Figure 1-6). Background research and field survey methods are given in Section 2.0; a review of existing data and field survey results for the Dry Lake Valley are given in Section 3.0. Section 4.0 discusses impacts and mitigations, and Section 5.0 contains conclusions and an evaluation of procedures. Section 6.0 contains the bibliography. Appendices contain federal and state threatened and endangered species listings, listings of animals expected in the Dry Lake Valley, transect results for the valley, examples of biological forms, location descriptions of the survey area, BLM memorandum 80-722, a list of contacts, a list of preparers, and a vegetative map.



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STUDY AREA

FIGURE 1-6

2.0 BACKGROUND RESEARCH

2.1 METHODOLOGY

Existing information on biological resources in Dry Lake Valley was obtained from a review of the scientific literature and from communications with federal and state agencies, various state and local organizations, and private individuals. Contacts included the Ely and Las Vegas District offices of the Bureau of Land Management (BLM); the Nevada Division of Wildlife; the Nevada State Museum; the Northern Nevada Native Plant Society; the University of Nevada at Reno; the U.S. Fish and Wildlife Service; and individual professional researchers in the area. Locations of threatened, endangered, or sensitive plants and distributions and ranges of sensitive and protected wildlife species were researched and when found, mapped to provide background information for the field crew during data collection. This information was also used to compile a species list and simplify data recording and compilation during field sessions.

Lists of threatened, endangered, or sensitive species and habitats were requested from the BLM, U.S. Fish and Wildlife Service, and Nevada Department of Wildlife. Published lists of the species were also obtained from the Federal Register, Northern Nevada Native Plant Society, and other sources. There are significant differences among these lists in terms of format and content. Some lists are specific to protected game animals, others are limited to threatened or endangered species, and

still others cite "sensitive" species, not legally protected but believed important for various reasons. Many species are present on several lists, whereas some species are found on only one.

Emphasis in this study was placed on plant and wildlife species protected as threatened or endangered under federal law and on wildlife protected as game species under state law. These lists and their application are discussed further in Section 2.3.

2.2 ABIOTIC ENVIRONMENT: REVIEW OF EXISTING DATA

The following discussion of abiotic factors is limited to features that are relevant to the plant and animal communities in the valley. These factors may be especially important in the case of threatened or endangered plants, which often occupy very narrow niches or have very specific habitat requirements.

2.2.1 Valley Description

Dry Lake Valley lies in east-central Lincoln County, Nevada, about 15 miles west of Pioche. The valley is bounded by the North Pahroc and Schell Creek ranges to the west and the Burnt Springs, Highland, Bristol, and Fairview ranges to the east. Muleshoe Valley borders Dry Lake Valley on the north, and Delamar Valley borders it on the south. Elevations in the valley range from approximately 4600 feet (1400 m) in the lower regions to approximately 5300 feet (1600 m) on upper bajadas. Dry Lake basin is approximately 61 miles (97.6 km) long and 20 miles (32 km) wide at its widest point.

2.2.2 Hydrology

Dry Lake Valley is bisected by Coyote Wash and has one spring, Coyote Spring. There are no perennial streams; surface runoff occurs only after high-intensity rains and snowmelt. Percolation and evaporation prevent most of this runoff from reaching the playas in the southern end of the valley.

There are no shallow aquifers in the valley. The ground-water level in Dry Lake Valley generally lies at intermediate depths (Fugro National, no date). Small quantities of perched water are available in some mountain valleys, but depths to the groundwater in central Dry Lake Valley are generally over 400 feet (123 m).

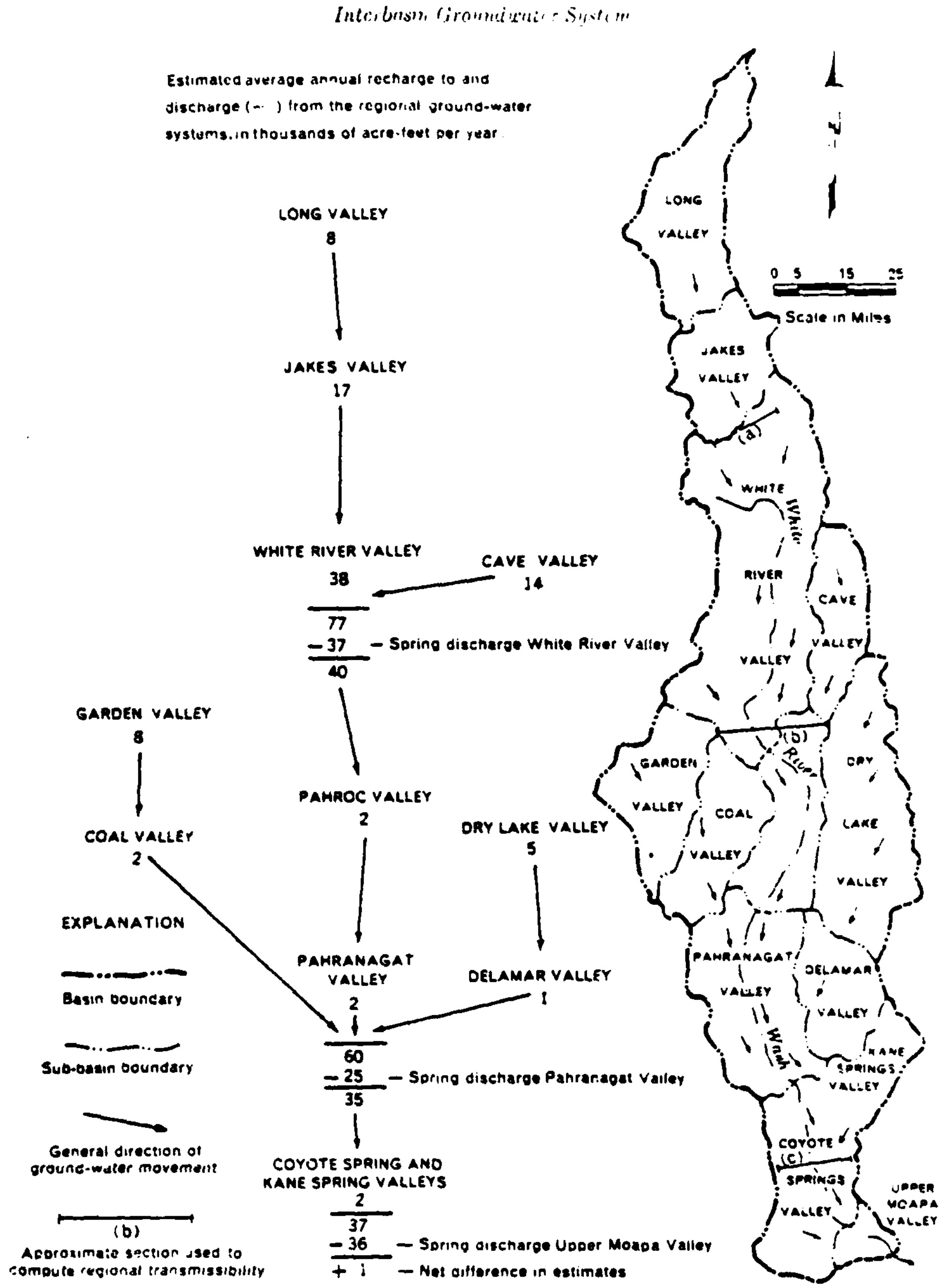
Precipitation in the mountains along the northwestern and eastern flanks of the valley is the major source of the ground water which flows laterally and downward toward the central part of the valley. Ground water moves out of Dry Lake Valley through fractured bedrock into other areas of the White River system, eventually reaching Coyote Spring Valley.

Figure 2-1 illustrates the hydrologic relationships between Dry Lake Valley and surrounding areas.

The depth to ground water in the central valley has limited development in the valley, although existing wells in the area produce small quantities of water for livestock.

2.2.3 Geology

The mountain ranges along the eastern side of the valley are composed of Paleozoic limestones and dolomites, and those along



SOURCE: EAKIN, 1966

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INTERBASIN GROUND-WATER SYSTEM

FIGURE 2-1

the northern and western sides are composed primarily of Tertiary volcanics with small limestone and dolomitic outliers (Fugro National, no date).

Alluvial and lake deposits make up the majority of basin-fill units in the valley; playa deposits are located in the south-central portion of the valley.

The Dry Lake fault scarp, which cuts alluvial fans along the eastern side of the valley, is a prominent feature of the study area. The scarp, which may result from a high magnitude fault displacement, extends nearly uninterrupted for approximately 218 miles (349 km). The Dry Lake scarp exhibits some characteristics of a shoreline but, unlike a shoreline, crosses elevation contours in an erratic manner. This could provide a number of unique microhabitats that possibly support vegetation not found in other areas.

Earth fissures occur in at least three areas west of the Ely Springs Range in Dry Lake Valley. The most prominent fissure is oriented east-west, and the other two are oriented north-south. These fissures may be the result of subsurface faulting (Fugro National, no date). Like the scarp, they may provide a number of unique microhabitats.

The soils in Dry Lake Valley vary from saline clay on and near the playas to dense gravel in a silty sand matrix on the high bajadas. The soils contain little organic material and seldom remain moist more than three consecutive months. In recent alluvial deposits and on actively eroding slopes, the soils

are characterized by a dominance of mineral matter. Soil characteristics, locations, and suitability for supporting vegetation are summarized in Table 2-1. Soils are important because they are correlated to the type of vegetation which may be found in an area.

2.2.4 Climate

Dry Lake Valley is in a transitional region; its southern portion borders on the Mohave Desert, and its northern portion lies in the Great Basin Desert. The valley has a semiarid climate, characterized by generally low precipitation and humidity, and by high summer temperatures and evaporation rates. Climatological data are not available from the valley but can be extrapolated from records of Caliente and Pioche, both located approximately 30 miles (48 km) away.

Precipitation in this area varies widely from year to year as well as throughout the year. In 1975, precipitation in Pioche measured 1.22 inches (3.1 cm); it was eight times greater (9.38 inches [23.8 cm]) in 1977. The averages and ranges of precipitation and temperature from 1975 to 1979 are shown in Table 2-2. Annual precipitation data for the period 1931 to 1961 in Alamo, Caliente, and Pioche are shown in Table 2-3. These data indicate the variation over a 30-year period. Variation of precipitation is important because many plants will not germinate unless certain minimum precipitation levels are reached. Composition of desert vegetation may therefore vary from year to year, depending on rainfall.

PHYSIO-GRAPHIC LOCATION	REPRE-SENTATIVE SOIL FAMILIES	SURFACE TEXTURE ---- SUBSURFACE TEXTURE	SOIL DEPTH	DRAINAGE ---- PERMEABILITY	AVAILABLE WATER CAPACITY	EFFECTIVE ROOTING DEPTH	EROSION HAZARD	ALKALINITY (pH)	SPECIAL CHARACTERISTICS
Playas and Adjoining Flood Plains	IGAT	Clay or Silty Clay --- Silty Clay	>60 in. (1.5 m)	Poorly Drained --- Very Slow	High	60 in. (1.5 m)	Wind erosion hazard severe on disturbed surfaces	>9.0	Strongly saline; high shrink-swell potential; low bearing capacity when wet
Valley Bottoms and Flood Plains	PENOYER	Silty Clay Loam --- Loamy Fine Sand and Sand	>60 in. (1.5 m)	Well Drained --- Moderately Slow	High	15-60 in. (38-150 cm)	Water erosion hazard slight; wind erosion hazard moderate on disturbed soil	8.0 to 8.8	Contains excess salts; subject to flood; suitable for crops if H_2O becomes available
	DELAMAR	Gravelly Sandy Loam --- Silica-Lime Cemented Hardpan	Shallow to Hardpan 24-40 in. (61-102 cm)	Well Drained --- Moderately Rapid to Hardpan	Moderately Low	24-30 in. (61-76 cm)	Slight	8.6	Suitable for crops if H_2O becomes available
Terrace and Alluvial Fans	TYBO	Gravelly Sandy Loam --- Silica-Lime Cemented Hardpan	Shallow to Hardpan 10-20 in. (25-51 cm)	Well Drained --- Moderately Rapid to Hardpan	Low	10-20 in. (25-51 cm)	Slight	8.6 to 8.8	Not suitable for crops or pasture
	WOOLSEY	Gravelly Sandy Loam --- Very Gravelly Sandy Loam	>60 in. (1.5 m)	Well Drained --- Moderately Slow	Moderate	24-60 in. (61-150 cm)	Slight to Moderate	8.4 to 8.6	Suitable for crops if H_2O becomes available
Mountains and Uplands	SIMPSON	Stony Clay Loam --- Very Gravelly Clay Over Hard Bedrock	20-40 in. to Hard Bedrock (51-102 cm)	Well Drained	---	20 in. (51 cm)	Slight to Severe	6.8	---
	ROOT	Stony Clay Loam or Bouldery Loam --- Hard Bedrock	Shallow Often 20 in. to Bedrock (51 cm)	Well Drained	---	20 in. (51 cm)	Slight to Severe	---	Rock outcrops are scattered throughout the soil unit

Source: HDR 1980.

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DRY LAKE VALLEY REPRESENTATIVE SOIL CHARACTERISTICS

TABLE 2 1

Year	Average Temperature[a] Cal.	Pio.	Highest Temperature[a] Cal.	Pio.	Lowest Temperature[a] Cal.	Pio	Total Precipitation[b] Cal.	Pio.
1975	--	48.9	105	96	--	4	3.33	1.22
1977	54.1	--	107	96	-13	-3	8.83	9.38
1979	52.1	50.3	105	96	4	7	9.31	11.02

Source: U.S. Dept. of Commerce, 1979. Climatological Data Annual summary. Vol. 94, No. 13.
_____, 1977. Vol. 92, No. 13.
_____, 1975. Vol. 90, No. 1.

(a) Degrees Fahrenheit.
(b) Inches.

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THREE-YEAR AVERAGE TEMPERATURE, TEMPERATURE EXTREMES, AND TOTAL PRECIPITATION FOR CALIENTE AND PIOCHE, NEVADA

TABLE 2-2

AVERAGE MONTHLY AND ANNUAL PRECIPITATION, IN INCHES (1931-1960)

LOCATION	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
Alamo	.70	.68	.68	.57	.45	.15	.73	.77	.32	.43	.43	.60	6.60
Caliente	.83	.79	.85	.70	.56	.39	.76	.92	.49	.89	.75	.86	8.79
Pioche[a]	1.55	1.26	1.46	1.19	.83	.33	.87	1.12	.69	1.18	.96	1.36	12.80

ANNUAL PRECIPITATION, IN INCHES, (1931-1961)

YEAR	ALAMO	CALIENTE	PIOCHE	YEAR	ALAMO	CALIENTE	PIOCHE
1931	9.60	9.49	—	1947	—	7.47	10.70
1932	9.68	11.61	—	1948	2.75	5.23	8.39
1933	7.29	8.16	—	1949	6.09	10.03	15.36
1934	3.01	7.14	—	1950	5.32	2.92	7.14
1935	5.58	9.43	—	1951	4.89	10.15	13.98
1936	8.97	11.60	—	1952	6.88	11.52	16.32
1937	6.30	6.84	—	1953	1.98	4.66	7.26
1938	11.15	—	—	1954	5.96	9.31	13.28
1939	7.42	9.41	10.05	1955	5.65	7.13	14.09
1940	6.16	7.49	13.48	1956	1.23	4.78	3.81
1941	14.91	18.73	22.38	1957	7.43	10.88	17.14
1942	2.94	6.63	7.18	1958	6.47	8.13	15.51
1943	—	11.70	16.08	1959	4.42	4.83	10.41
1944	—	7.96	11.59	1960	6.02	9.77	12.85
1945	10.65	11.60	20.60	1961	3.63	8.80	9.62

Source: Groundwater Resources—Reconnaissance Series Report 16, Groundwater Appraisal of Dry Lake and Delamar valleys, Lincoln County, Nevada, U.S. Weather Bureau, in HDR, 1980.

(a) Average for 1939-60.

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SUMMARY OF PRECIPITATION AT ALMO, CALIENTE, AND PIOCHE, NEVADA 1931–1961

TABLE 2 3

2.3 BIOTIC ENVIROMENT: REVIEW OF EXISTING DATA

2.3.1 Vegetation Types

The area being considered for the MX system is almost entirely within the Intermountain Region of the United States, which has no water drainage to the sea. The Intermountain Region is divided into four major vegetation divisions: the Great Basin, the Wasatch Mountains, the Colorado Plateau, and the Uinta Mountains. The Great Basin, the largest division, is divided into nine sections. Dry Lake Valley lies mostly within the Tonopah Section of the Great Basin but extends northward into the Calcareous Mountain Section (Cronquist, 1972).

The Tonopah Section covers approximately 22,000 mi^2 (56,980 km^2), much of which is volcanic in origin. It consists mainly of hot, dry, desert valleys with shadscale (*Atriplex confertifolia*) as the generally dominant shrub. Sagebrush (*Artemisia tridentata*) and pinyon pine (*Pinus monophylla*)/Utah juniper (*Juniperus osteosperma*) regions are found along the upper bajadas and lower mountain slopes in this area.

Endemic plants in the Tonopah Section include:

Gilia nyensis	*Astragalus beatleyae*
Lupinus holmgrenanus	*Cymopterus ripleyi*
Miabilis pudica	*Eriogonum concinnum*
Penstemon arenarius	*Eriogonum umbellatum* var *vernum*

The Calcareous Section, covering more than 16,000 mi^2 (41,440 km^2), is typified by limestone mountains, by high valleys containing *Artemisia*, and by the lack of permanent lakes in the

basins. The southern limits of this section run around the south end of the Highland, Schell Creek, and Egan ranges. This section has the most endemic plant species of any section within the Great Basin. Some of these species include (Cronquist, 1972):

Arenaria stenomeres
Astragalus calycosus var. *monophyllidius*
Astragalus chamaemeniscus
Astragalus convallarius var. *finitimus*
Astragalus lentiginosus var. *latus*
Astragalus minthorniae var. *gracilior*
Astragalus oophorus var. *lonchocalyx*
Cymopterus basalticus
Erigeron jonesii
Eriogonum eremicum
Eriogonum holmgrenii
Frasera gypsicola
Lewisia maguirei
Machaeranthera grindelioides var. *depressa*
Penstemon concinnus
Penstemon decurvus
Penstemon francisci-pennellii
Penstemon nanus
Phlox griseola subsp. *tumulosa*
Phlox kelseyi subsp. *salina*
Primula nevadensis
Scutellaria nana var. *sapphirina*

Plant communities within the Great Basin have been divided into vegetation types or zones defined as "large climax unit[s] whose boundaries are caused primarily by the effects of the climate and soil on the distribution of the dominant species of the zone" (Billings, 1951). Other studies of vegetation zones in the Great Basin have been conducted by Graham (1937) and Beatley (1976). Vegetation types are important because they provide information on possible wildlife habitats.

The four principal intermountain vegetation zones are Creosote Bush, Shadscale, Sagebrush, and Pinyon-Juniper. These zones and their principal plant communities are outlined in Table 2-4.

Creosote Bush Zone

- Creosote bush (*Larrea tridentata*) community
- Hopsage (*Grayia spinosa*) community
- Joshua tree (*Yucca baccata*) community

Shadscale Zone

- Shadscale (*Atriplex confertifolia*) community
- Winterfat (*Ceratoides lanata*) community
- Disturbance (*Salsola iberica*, *Bromus tectorum*) community
- Blackbush (*Coleogyne spinescens*) community
- Greasewood (*Sarcobatus vermiculatus*) community
- Saltgrass (*Distichlis* spp., *Sporobolus airoides*) community

Sagebrush Zone

- Big Sagebrush (*Artemisia tridentata*) community
- Bunchgrass (*Hilaria* spp., *Aristida* spp.) community

Pinyon-Juniper Woodland Zone

- Open woodland community

* Based on communities described by Cronquist, 1972.

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PLANT ZONES AND PRINCIPAL COMMUNITIES EXPECTED IN THE DRY LAKE STUDY AREA

TABLE 2-4

Creosote Bush Zone

Although most of this vegetation zone lies south of Dry Lake Valley and very little creosote bush is found in the valley, transitional associations such as hopsage and Joshua tree associations are present. Blackbrush, also found in Dry Lake Valley, is associated with both creosote bush and shadscale communities. Shrubs typical of the creosote bush zone include:

Acamptopappus shockleyi
Ambrosia dumosa
Atriplex confertifolia
Dalea fremontii
Ancelia farinosa
Ceratoides lanata
Grayia spinosa
Krameria parvifolia
Lycium andersonii
Mendora spinescens
Opuntia spp.
Yucca schidigera

Shadscale Zone

This zone accounts for the majority of the vegetation in the valley. The Shadscale Zone, also called the Saltbush or Salt Desert Scrub Zone, is usually dominated by shadscale. Shadscale has a lower moisture requirement and a higher salt tolerance than sagebrush, and thus it is found in dry saline areas. It has been considered an edaphic climax on somewhat saline valley soils (Cronquist, 1972). It may occur on valley bottoms or rocky slopes and is common in western Nevada valleys having an annual precipitation ranging from 3.5 to 7.0 inches (8.9 - 17.8 cm). Within the shadscale zone there are several plant associations controlled by differences in soil salinity or aridity.

The climax community is dominated by shadscale and galleta grass. Winterfat is often found in pure stands within the shadscale and sagebrush vegetation zones. This is a highly desirable browse species for many wild and domestic herbivores. There are considerable winterfat areas within Dry Lake Valley at present, but disturbance or overgrazing of winterfat areas has tended, over a period of time, to eliminate this species in favor of cheatgrass (Bromus tectorum), Russian thistle (Salsola iberica), or Halogeton (Halogeton glomeratus).

Halogeton, an annual weed introduced from Asia, spreads rapidly in disturbed areas, and no means of eradication have been found. It contains a large quantity of oxalic acid and is very toxic to grazing livestock (Cronquist, 1972).

Cheatgrass is an annual grass introduced from Eurasia. It spreads rapidly, crowding out native grasses in overgrazed areas. It finishes its growing cycle early in the year and becomes a fire hazard in the summer. Chukar partridge (Alectoris chukar) rely heavily on cheatgrass in the winter. The barbed seeds of the cheatgrass cling to the hair of animals and are spread to new areas during grazing (Hitchcock and others, 1964).

Russian thistle or tumbleweed is not a true thistle, but is a member of the family Chenopodiaceae. It rapidly invades disturbed or overgrazed ranges and is perhaps the most common weed of the semidesert areas of western North America. Domestic livestock which eat green Russian thistle are subject to scours (Hitchcock and others, 1964).

Blackbrush and galleta grass form a community on non-saline, sandy soils in areas where rainfall is less than 6 inches (15 cm) (Cronquist, 1972).

Artemisia spinescens, often with greasewood (Sarcobatus vermiculatus), is found on the more saline valley floors. Where the salt level gets very high, such plants as iodinebush (Allenrolfea sp.) and dropseed (Sporobolus airoides) appear more frequently (Cronquist, 1972).

Sagebrush Zone

Areas with rainfall over 7 inches (17.8 cm) are similar to shadscale areas but have a sagebrush or a sagebrush-grass climax vegetation. Big sagebrush (Artemisia tridentata) is the most common species, but A. arbuscula and A. nova also cover considerable areas within this zone. Bitterbrush (Purshia tridentata) is palatable to many wild and domestic animals. It rapidly disappears in overgrazed areas, although it will slowly recover from its rootstocks if the roots are not damaged and if wildlife or livestock foraging is not too severe (Cronquist, 1972).

Various rabbitbrush communities (Chrysothamnus viscidiflorus, C. greenei, and C. nauseous) are found within the sagebrush zone, and C. viscidiflorus is a very common subdominant plant in sagebrush areas.

Some important shrubs of the sagebrush zone include (Cronquist, 1972):

Coleogyne ramosissima
Ephedra torryana

Ephedra viridis
Grayia spinosa
Leptodactylon purgens
Ribes velutinum
Symphoricaysost sp.
Tetradymia glabata

Pinyon-Juniper Zone

This is the major forest type of the Intermountain Region. Its range is usually from 5000 to 8000 feet (1538 to 2461 m) in elevation on the lower mountain slopes and upper bajadas in the valleys. Pinyon juniper woodland is found at the edges of Dry Lake Valley. The forest canopy in this community is not solid, and a significant number of shrubs are present including (Cronquist, 1972):

Artemisia spp.
Chrysothamnus spp.
Cowania mexicana
Ephedra viridis
Gutierrezia sarothrae
Quercus gambelii
Sambucus racemosa
Symphoricarpos oreophilis
Tetradymia canescens

2.3.2 Threatened, Endangered, and Sensitive Plant Species

The Endangered Species Act, P.L. 93-205, was enacted in December 1973 to provide a means for conserving threatened and endangered species and their ecosystems. The act includes the following definitions:

Endangered Species -- Those species of plants in danger of extinction throughout all or a significant portion of their range.

Threatened Species -- Those species of plants that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Plant species whose existence is threatened or endangered are listed in the Federal Register (15 December 1980). The purpose of the list is to advise interested agencies and conservation groups of the species and associated habitats that are in need of special protection (Ayensu and Defilipps, 1978). Because of its length, the Federal Register lists and guidelines concerning these lists are included in Appendix A.

Two lists from the 15 December 1980 Federal Register were considered in this study: Taxa Currently Listed and Taxa Currently Under Review (or Candidate Species). The third list, Taxa Currently Proposed, includes no species within Nevada and, thus, is not addressed further here. Taxa Currently Under Review were considered because of the possibility that they may eventually become listed and because the Federal Register (15 December 1980) states that they should be considered in environmental planning. The U.S. Fish and Wildlife Service also recommends that an informal Section 7 (Endangered Species Act) consultation be initiated whenever a candidate species might be affected (Holm, 1981; and Gore, 1981).

BLM Memorandum No. 80-722 (see Appendix B) contains management guidelines that specify all candidate species for Federal threatened or endangered status should automatically be added to appropriate BLM state lists. These guidelines further state that:

> Candidate species for Federal threatened and endangered status and sensitive species must be accorded full protection of the Endangered Species Act unless

> it is determined by the State Director on a case-by-case basis that information on the occurrence of a plant species is adequate to allow a specific action (U.S. Department of the Interior, 1980).

The State of Nevada has also enacted legislation for the protection and propagation of native flora (NRS 527.270). The relevant sections and the species considered as critically endangered under this legislation are shown in Appendix B. Nevada plants considered threatened and endangered by the Northern Nevada Native Plant Society (NNNPS) are also listed in Appendix B.

The Sikes Act of 1973 (16 U.S.C. 670h) mandates that, in addition to the Federal Register listing, the BLM also honor state laws and lists. The policy statement and management guidelines of BLM concerning threatened and endangered plants reflect this and are contained in Memorandum No. 80-722. It is BLM policy to "protect, conserve and manage federally and state-listed or candidate listings of sensitive, threatened or endangered plants [species]." The policy memo states:

> The objective of all programs will include the means to conserve officially listed plants, to promote delisting, and/or to enhance or maintain the ecosystems occupied by plants on Federal or official State inventories. It is also policy to ensure that the habitats of sensitive plants will be managed and/or conserved to minimize or eliminate the need for Federal or State listing in the future.

Threatened and endangered plants usually occupy niches in locally unique, unusual, or isolated habitats that are ecologically and geographically restricted. These habitats include rocky ridges; rocky outcrops or breaks; high elevations; lowland

valleys; limestone outcrops; and heavy, saline, and sandy soils (Welsh and others, 1975, and Harrison, 1980).

Prior to the field investigations conducted in 1980 (see Section 3.0), no threatened or endangered plant species were recorded from Dry Lake Valley (Pinzl, 1979; HDR, 1980a; and BLM, 1980b).

2.3.3 Rare, Threatened, and Endangered Wildlife Species

The federally listed threatened and endangered wildlife species that occur in Nevada and Utah are shown in Table 2-5. The rare, protected, and endangered species of wildlife on the Nevada state list are shown in Table 2-6. Species on both lists were of special concern during this study.

2.3.4 Sensitive Wildlife Species and Habitat

In addition to federal and state species listings, the Nevada Department of Wildlife has provided a list of species and habitats considered sensitive (Molini, 1980).

Sensitive habitats include:

- Riparian communities: including the desert riparian types often associated with washes having intermittent water, (this category includes springs, seeps, and live and/or intermittent streams or drainages);
- Wetlands: all marshes or ponds or other wetlands that provide habitat for waterfowl and shore birds as well as aquatic furbearers;
- Caliche washes: important habitat for desert tortoise;
- Ecotonal areas: especially pinyon/juniper and salt desert shrub or northern desert shrub types and important nesting areas for Ferruginous hawks;
- Sage grouse strutting grounds;
- Antelope kidding grounds, concentration areas, and migration routes;

Species	State Expected	Status
Brown or grizzly bear (Ursus arctos horribilis)	UT, NV	T
Utah prairie dog (Cynomys parvidens)	UT	E
Black footed ferret (Mustela nigripes)	UT	E
Bald eagle (Haliaeetus leucocephalus)	UT, NV	E
American peregrine falcon (Falco peregrinus anatum)	UT, NV	E
Arctic peregrine falcon (Falco peregrinus tundrius)	UT (migrant)	E
Pahranagat bonytail (Gila robusta jordani)	NV	E
Bonytail chub (Gila elegans)	UT, NV	E
Humpback chub (Gila cypha)	UT	E
Cui-ui (Chasmistes cujus)	NV	E
Moapa dace (Moapa coriacea)	NV	E
Pahrump killifish (Empetrichythys latos)	NV	E
Devil's Hole pupfish (Cyprinodon diabolis)	NV	E
Warm Springs pupfish (Cyprinodon nevadensis pectoralis)	NV	E
Colorado River squawfish (Ptychocheilus lucius)	UT, NV	E
Lahontan cutthroat trout (Salmo clarki henshawi)	NV	T
Woundfin (Plagopterus argentissimus)	NV, UT	E

Source: Federal Register, May 20, 1980.

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THREATENED AND ENDANGERED WILDLIFE EXPECTED IN NEVADA AND UTAH

TABLE 25

Common Name	Scientific Name	State Status
Game Animals		
Pronghorn antelope	Antilocapra americana	All
Bear	Ursus americanus	Protected[a]
Deer	Odocoileus spp.	
Mountain goat	Oreamnos americanus	
Mountain lion (cougar)	Felis concolor	
Moose	Alces americana	
Peccary	Pecari angulatus	
Audubon cottontail rabbit	Sylvilagus audubonii	
Nuttall cottontail rabbit	Sylvilagus nuttallii	
Pigmy rabbit	Sylvilagus idahoensis	
Snowshoe hare	Lepus americanus	
White-tailed jackrabbit	Lepus townsendii	
Bighorn sheep	Ovis canadensis canadensis Ovis canadensis nelsoni Ovis canadensis californiana	
Elk	Cervus canadensis	
Fur-Bearing Animals		
Beaver	Castor canadensis	All
Bobcat	Lynx rufus	Protected[a]
Gray fox	Urocyon cinereoargenteus	
Kit fox (swift fox)	Vulpes macrotis nevadensis and Vulpes macrotis arsipus	
Red fox	Vulpes fulva	
Martin	Martes caurina	
Mink	Mustela vison	
Muskrat	Ondatra zibethica	
Nutria	Myocaster coypus	
River otter	Lutra canadensis	
Other Animals		
Mountain beaver	Aplodontia rufa	Protected
Pika	Ochotona princeps	Protected
Douglas squirrel	Tamiasciurus spp.	Protected
Flying squirrel	Glaucomys spp.	Protected
Gray squirrel	Sciurus spp.	Protected
Spotted bat	Euderma maculatum	Rare

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PROTECTED, THREATENED AND ENDANGERED WILDLIFE ON THE NEVADA STATE LIST

TABLE 2-6

Common Name	Scientific Name	State Status
Southern bald eagle	Haliaeetus leucocephalus leucocephalus	Endangered
Peregrine falcon	Falco peregrinus	Endangered
Golden eagle	Aquila chrysaetos	Protected
Merlin (pigeon hawk)	Falco columbarius	Protected
Prairie falcon	Falco mexicanus	Protected
American kestrel (sparrow hawk)	Falco sparverius	Protected
Cooper's hawk	Accipiter cooperii	Protected
Ferruginous hawk	Buteo regalis	Protected
Goshawk	Accipiter gentlia	Protected
Harris hawk	Parabuteo unicinctus	Protected
Northern harrier (marsh hawk)	Circus cyaneus	Protected
Red-tailed hawk	Buteo jamaicensis	Protected
Rough-legged hawk	Buteo lagpus	Protected
Sharp-shinned hawk	Accipiter striatus	Protected
Swainson's hawk	Buteo swainsoni	Protected
White-faced Glossy Ibis	Plegadis chihi	Protected
Belted kingfisher	Megaceryle alcyon	Protected
Nighthawk	Chordeiles spp.	Protected
Osprey	Pandion haliaetus	Protected
Barn owl	Tyto alba	Protected
Burrowing owl	Athene cunicularia	Protected
Great horned owl	Bubo virginianus	Protected
Long-eared owl	Asio otus	Protected
Short-eared owl	Asio flammeus	Protected
Brown pelican	Pelecanus occidentalis	Protected
White pelican	Pelecanus erythrorhynchos	Protected
Road runner	Geococcyx californianus	Protected
Turkey vulture	Cathartes aura	Protected

Protected and Endangered Birds

"Protected birds shall include those species of nongame birds protected by Federal law in accordance with the Migratory Bird Treaty Act of July 3, 1918 (40 Stat. 755; 16 U.s.C. 703-711), as amended, the Eagle Act of June 8 1940 (54 Stat. 150; 16 U.S.C. 668), as amended and Federal Regulations adopted pursuant thereto."

"Protected birds shall also mean and include all species of the Orders Falconiformes (vultures, hawks and falcons) and Strigiformes (owls) and of the Family Pelecanidae (pelicans). Species shall include, but are not limited to the "above:"

Common Name	Scientific Name	State Status

Game Birds

Upland Game Birds shall mean and include all species of the Order Galliformes, Tinamiformes and Columbiformes (except those classified as migratory game birds) and include, but are not limited to the following:

Common Name	Scientific Name	State Status
Blue grouse	*Dendragapus obscurus*	Protected
Ruffed grouse	*Bonasa umbellus*	Protected
Sage grouse	*Centrocercus urophasianus*	Protected
Sharp-tailed grouse	*Pedioecetes phasianellus*	Protected
Chukar partridge	*Alectoris chukar*	Protected
Gray partridge (hungarian)	*Perdix perdix*	Protected
Seesee partridge	*Ampoperdix griseogularis*	Protected
Snow partridge	*Tetrogallus himalayensis*	Protected
Ring-necked pheasant	*Phasianus colchicus*	Protected
White-wing pheasant	*Phasianus colchicus*	Protected
Bobwhite quail	*Colinus virginianus*	Protected
California quail	*Lophortyx californicus*	Protected
Gambel's quail	*Lophortyx gambelii*	Protected
Mountain quail	*Oreortyx pictus*	Protected
Scaled quail	*Callipepla squamata*	Protected
Tinamou	*Eudromia elegans*	Protected
Merriam's turkey	*Meleagris gallopavo*	Protected

Migratory Game Birds

Migratory game birds shall mean and include all species of the category "Game birds" as protected by federal law under authority of the Migratory Bird Treaty Act of July 3, 1918 (40 stat. 735; 16 U.S.C. 703-711) as amended.

Protected, Rare and Endangered Fish

Common Name	Scientific Name	State Status
Big Spring spinedace	*Lepidomeda mollispinis pratensis*	Protected
Colorado bonytail	*Gila elegans*	Rare
Desert dace	*Eremichthys acros*	Rare
Moapa Dace	*Moapa coriacea*	Rare
Relict (Steptoe) dace	*Relictus solitarius*	Rare
Nevada pupfish	*Cyprinodon nevadensis*	Rare
Virgin River spinedace	*Lepidomeda mollispinis mollispinis*	Rare
White River spinedace	*Lepidomeda albivalis*	Rare

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PROTECTED, THREATENED AND ENDANGERED WILDLIFE ON THE NEVADA STATE LIST

PAGE 3 OF 4 TABLE 2-6

Common Name	Scientific Name	State Status
Railroad Valley spring-	Crenichthys nevadae	Rare
White River springfish	C. baileyi	Rare
Humpback sucker	Xyrauchen texanus	Rare
White River sucker	Pantostens intermedius	Rare
Woundfin	Plagopterus argentissimus	Rare
Pahranagat bonytail	Gila robusta jordani	Endangered
Pahrump killifish	Empetrichthys latos	Endangered
Cui-ui	Chasmistes cujus	Endangered
Devil's Hole pupfish	Cyprinodon diabolis	Endangered
Colorado squawfish	Ptychocheilus lucius	Endangered
Utah Cutthroat trout	Salmo clarki utah	Endangered

Game Fish

All varieties of trout, charr, salmon and whitefish except the Utah Cutthroat trout, which is classified as endangered.

All varieties of catfish and bullheads.

All varieties of perch, crappie, bass, bluegill and other sunfish, walleye and pike.

Game Amphibian

Bullfrog	Rana catesbeiana	Protected

Rare Reptiles

Gila monster	Heloderma suspectum	Rare
Desert tortoise	Gopherus agasizzi	Rare

Source: Nevada Board of Fish and Game Commissioners, Commission General Regulation No. 1(8), Effective Date: March 6, 1978.

(a) Assumed from the fact that these groups are excluded from the "Unprotected Animals" category.

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PROTECTED, THREATENED AND ENDANGERED WILDLIFE ON THE NEVADA STATE LIST

TABLE 2-6

- o Desert tortoise major or winter burrows that extend deep into the ground;
- o Raptor nest sites, including cliffs, riparian aspen, pinyon, and juniper trees on the ecotone with valleys;
- o Springs, lakes, ponds, and streams that support fish populations;
- o Kit and gray fox burrows or den sites; and
- o Mule deer winter and spring ranges.

Sensitive wildlife species include:

- o Ferruginous hawks;
- o Goshawks;
- o Cooper's hawks;
- o Sage grouse;
- o Antelope;
- o Desert tortoise; and
- o Gila monster (may not be found in Nevada MX area).

These species as well as others given in Table 2-6 are protected by state law as game animals, furbearers, or sensitive species. Game and furbearing animals are protected by restricting game season, number and area of harvest, or other factors. Species identified from background research as possibly occurring in Dry Lake Valley during all or part of their life cycle include:

- o Antelope;
- o Bighorn sheep;
- o Mule deer;
- o Kit fox;
- o Gray fox;
- o Bobcat;
- o Wild horses and burros;
- o Raptors (eagles, hawks, falcons); and
- o Game birds.

2.3.4.1 Antelope

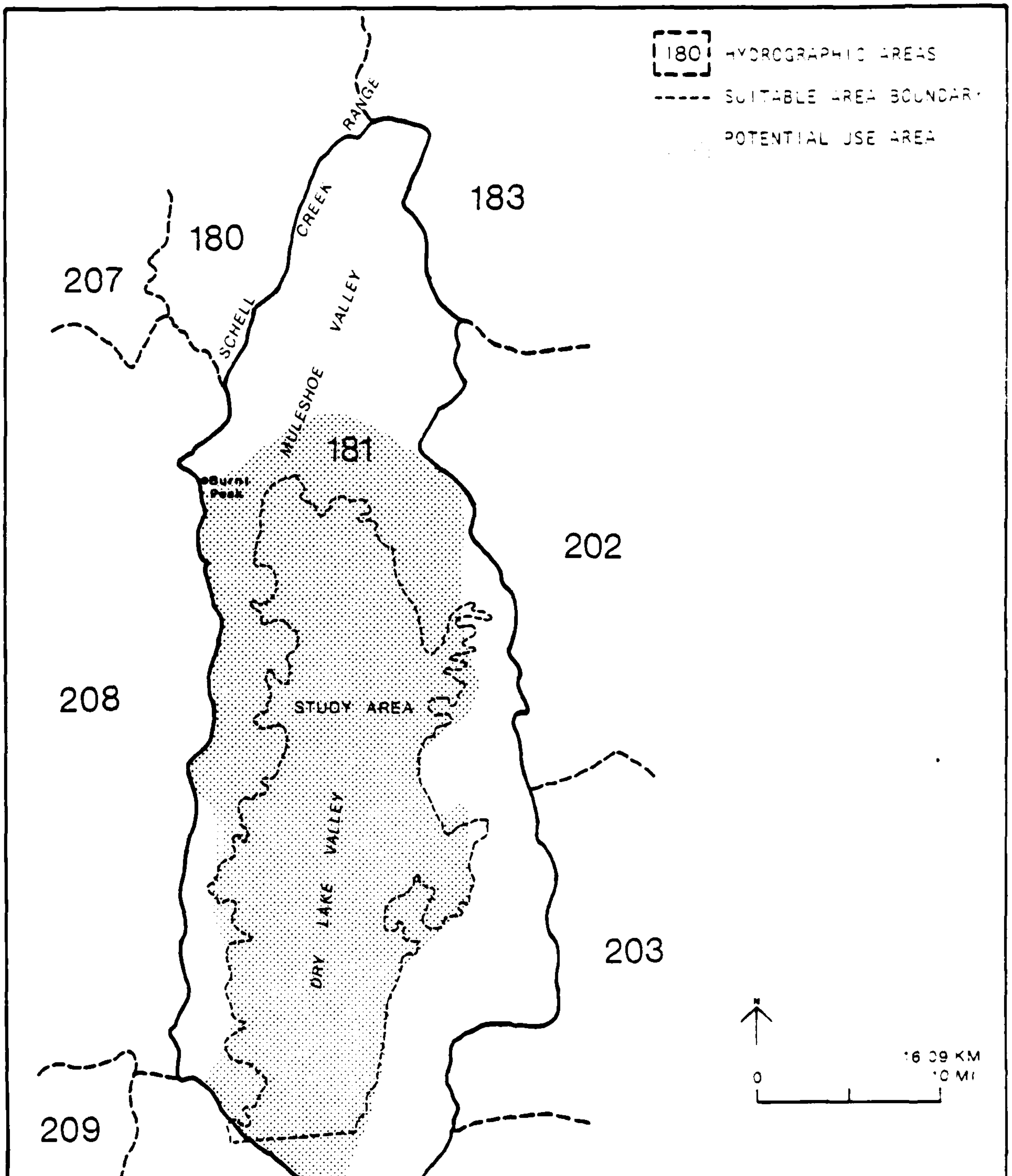
Pronghorn antelope require large open spaces; fences and cultivated fields reduce its range, and domestic livestock grazing

reduces its food supply (State of Nevada, 1973). Due to the heavy use of Dry Lake Valley by domestic livestock, antelope may use the valley only during migration. Pronghorn are generally not considered a migratory species but do move to locate adequate forage and water. Their optimum elevation ranges from 4000 to 6000 feet (1231 to 1846 m), and optimum precipitation levels range from 10 to 15 inches (25 to 38 cm) per year. Water must be available within 1 to 5 miles (2 to 8 km), and each animal requires 3 to 5 quarts (3 to 6 l) of water a day (Sundstrom, and others, 1973). The antelope's dependence on water can be reduced in hot areas by the ingestion of certain plants such as succulent forbs.

Antelope occur in areas of big sagebrush at the northern end of Dry Lake Valley. This is to be expected, since sagebrush is an important component in their diet. Optimum habitat is characterized by open cover of low vegetation. Plant species diversity, especially succulent forbs, is also important to antelope habitat. A mix of about 40 to 60 percent grasses, 10 to 30 percent forbs, and five to 20 percent browse is required (Yoakum, 1978). The areas in Dry Lake Valley potentially used by pronghorn antelope are illustrated in Figure 2-2. Distribution of antelope activity, as observed from the field survey in Dry Lake Valley, is discussed in Section 3.2.

2.3.4.2 Bighorn Sheep

Diet of the bighorn sheep includes bud sage, shadscale, desert mallow, and bunch grasses. Bighorn sheep compete with domestic



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PRONGHORN ANTELOPE
POTENTIAL USE AREAS

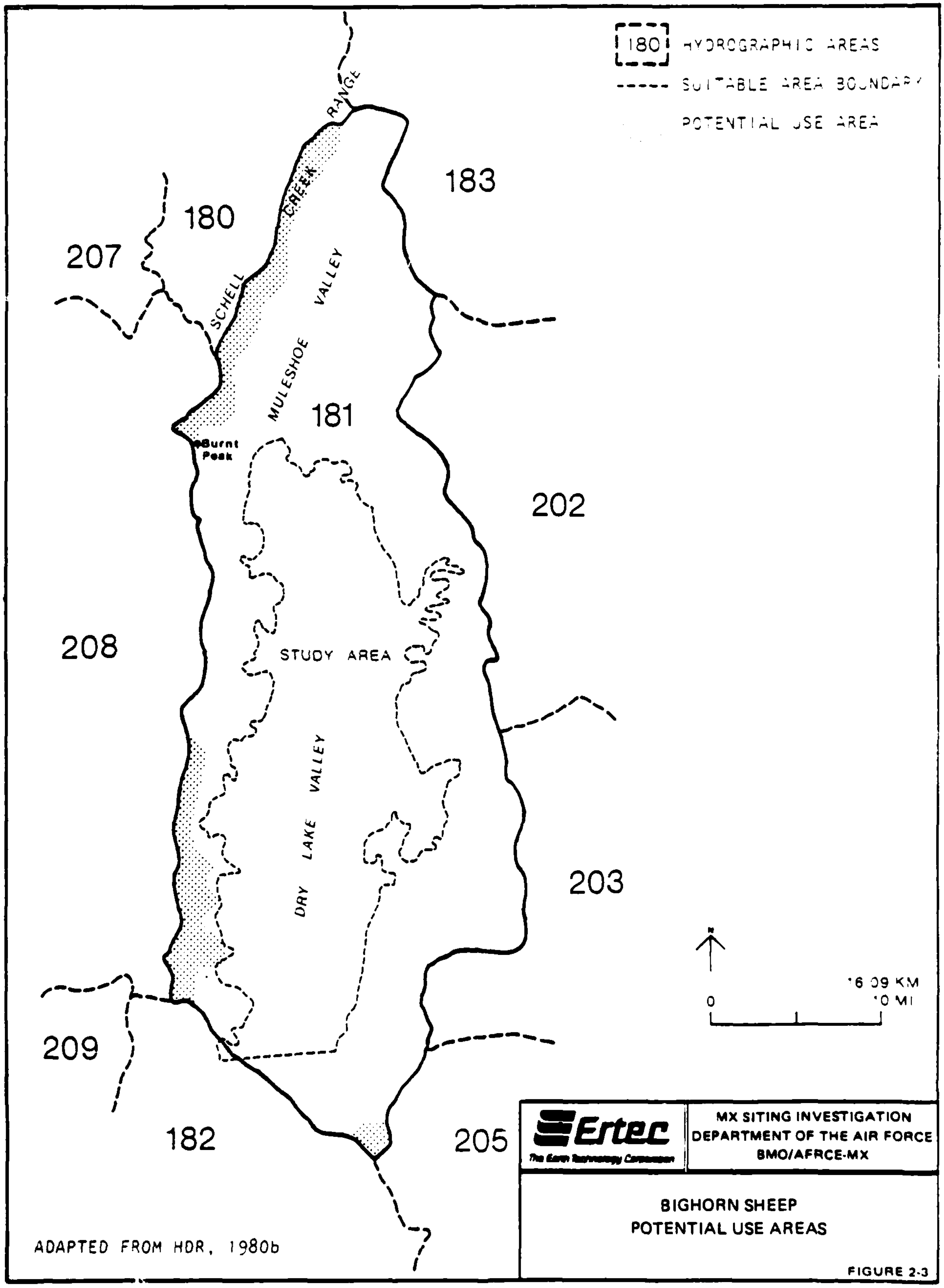
FIGURE 2-2

stock for food and water (State of Nevada, 1973). This competition appears to be the most important factor in the extirpation of bighorns from northern, central, and parts of southern Nevada, although overhunting has also been a factor (McQuivey, 1978). The large population of domestic stock in Dry Lake Valley may prevent the extension of bighorn sheep into the valley area, although the southwestern border of the valley is thought to be used by bighorn at present (HDR, 1980b).

Water is the primary limiting factor in bighorn distribution, especially during summer when a water source must be within 2 miles (3 km) (McQuivey, 1976 and 1978). The requirement for accessible free water decreases during the other seasons and may be nonexistent in winter. Other habitat requirements include nearby escape cover and adequate forage.

Bighorns migrate seasonally to and from water sources. During winter, populations are dispersed to areas not containing permanent water sources. During summer, bighorn concentrate around permanent water sources and, as a result, occupy only 15 to 20 percent of the available habitat. Migrations to lower elevations in winter and to higher elevations in summer also occur. In addition, long-range migrations between mountain ranges occasionally occur, although distance traveled is generally less than 40 miles (64 km). Migrating sheep usually follow contour lines or take the shortest distance between rocky points (McQuivey, 1978).

Areas having potential use by bighorn sheep are shown in Figure 2-3; field survey results are discussed in Section 3.2.



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BIGHORN SHEEP
POTENTIAL USE AREAS

FIGURE 2-3

2.3.4.3 Mule Deer

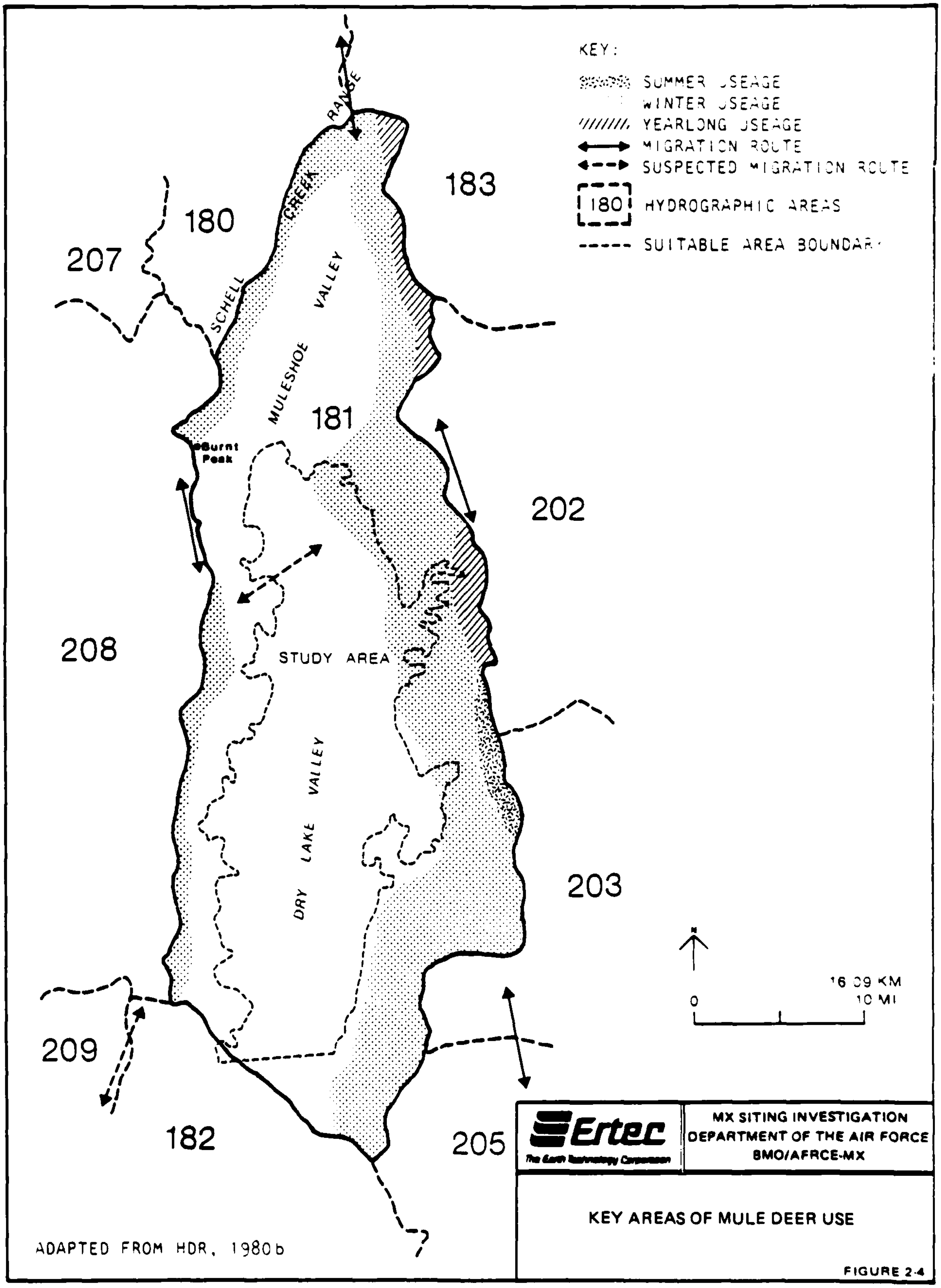
Mule deer are browsers that feed on aspen, berry shrubs, sagebrush, cliff rose, bitterbrush, manzanita, grasses, and forbs.

Nearly all deer in Nevada migrate between summer and winter ranges, which are further divided into summer, winter, spring, and year-round-use areas (State of Nevada, 1973). Summer ranges occur at higher elevations where water and forage are available during the hot, dry months. In winter, deep snows force deer to lower elevations where they often concentrate in areas providing forage and cover. Such areas are critical for deer survival (Wallamo, 1978). Deer migrate between these seasonal ranges along fairly well established routes. Migration to other areas is also common.

Mule deer are found on the slopes and mountains surrounding Dry Lake Valley as shown in Figure 2-4. Winter habitat is found on the lower slopes, and a key winter area is found in the northeastern portion of the study area. A possible migration route crosses Dry Lake Valley in the vicinity of Coyote Wash near Coyote Springs.

2.3.4.4 Kit Fox

The kit fox is chiefly a desert animal found in the arid southwest (Murie, 1974). Common prey species include rabbits, small rodents, and small birds. The kit fox uses its den as a year-round refuge from the harsh environment, and it avoids the hot daytime temperatures by remaining in the den during the day and hunting at night (Egoscue, 1962). The den is often on the sandy



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KEY AREAS OF MULE DEER USE

FIGURE 2-4

plain and may have several entrances that measure 8 inches (20 cm) or more in diameter. Kit fox dens are considered key-use areas by the Nevada Department of Wildlife (Molini, 1980). Distribution of kit fox in southern Nevada is shown in Figure 2-5. They are expected to occur in Dry Lake Valley.

2.3.4.5 Gray Fox

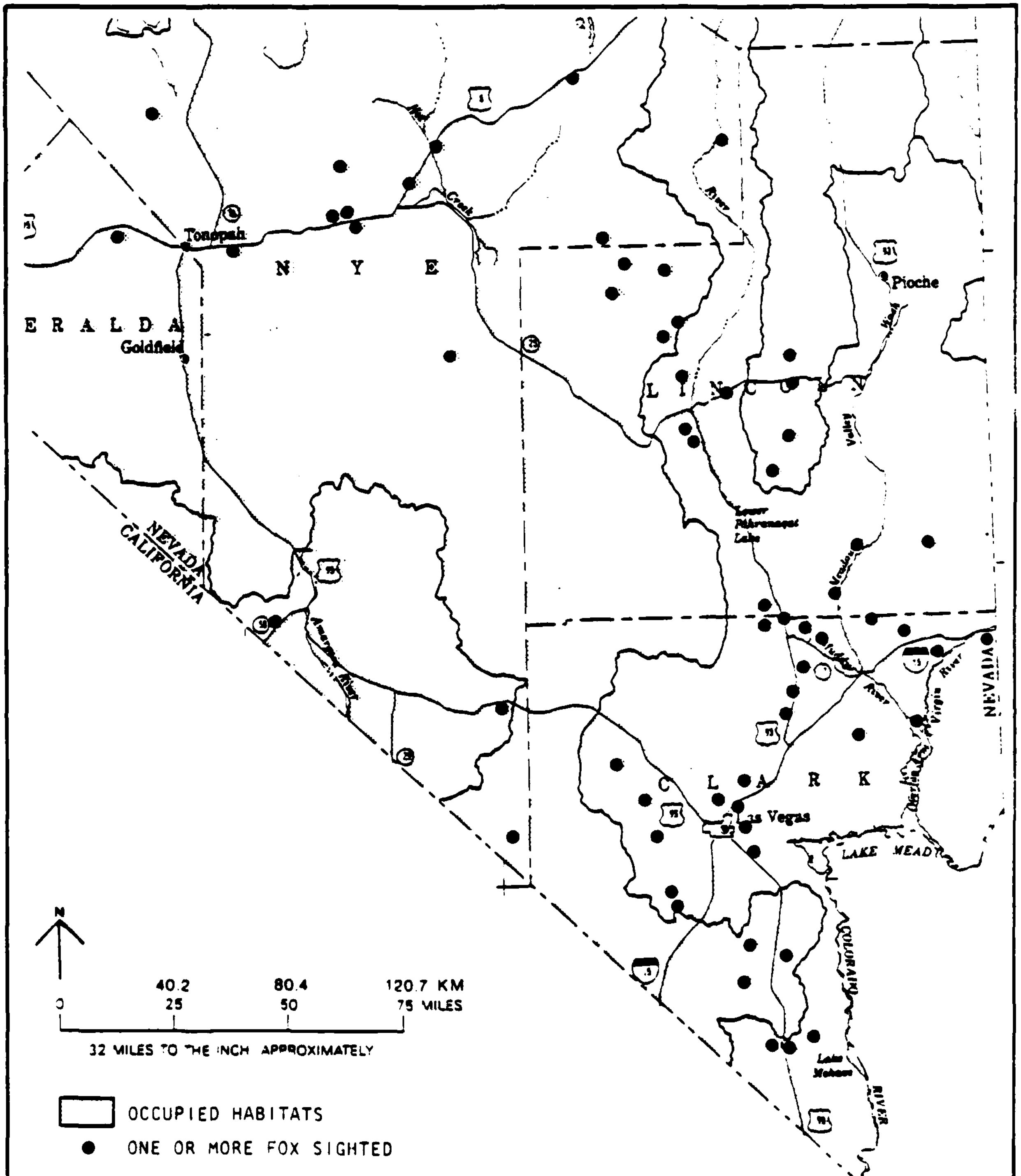
Gray fox dens may occur in a variety of habitats, including below ground, among rocks, and even in hollow trees (Murie, 1974). The population of gray fox in southern Nevada has increased in recent years in response to increased precipitation (Lee, 1981). Common prey of the grey fox include small rodents and rabbits. The gray fox distribution in southern Nevada is shown in Figure 2-6. They may be expected to occur in the vicinity of Dry Lake Valley.

2.3.4.6 Bobcat

Rocky areas at canyon mouths are considered the optimum habitat for bobcat, but bobcats are also known to occur in desert valleys, especially in wash areas, although in lesser densities (Molini, 1981; and Lee, 1981). The primary prey of the bobcat are rabbits and small mammals. The bobcat distribution in southern Nevada is shown in Figure 2-7. Bobcat may be expected to occur in the vicinity of Dry Lake Valley.

2.3.4.7 Wild Horses and Burros

Wild horses and burros are known to exist in Dry Lake Valley. A 1975 survey indicated that the northeastern portion of Dry Lake



SOURCE: NEVADA DEPT. OF WILDLIFE, 1980

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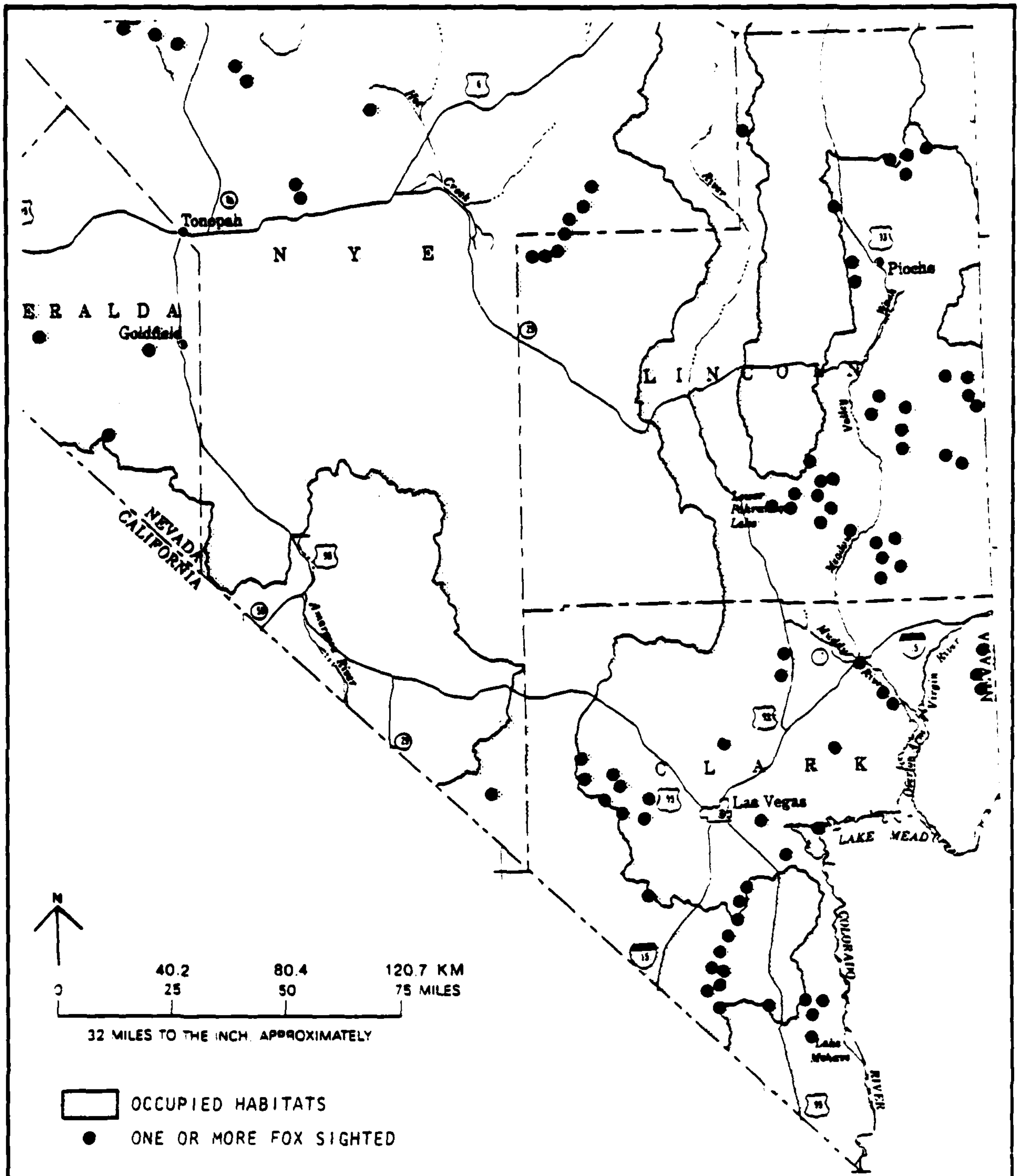
KIT FOX DISTRIBUTION
IN SOUTHERN NEVADA

FIGURE 25



SOURCE: NEVADA DEPT. OF WILDLIFE, 1980

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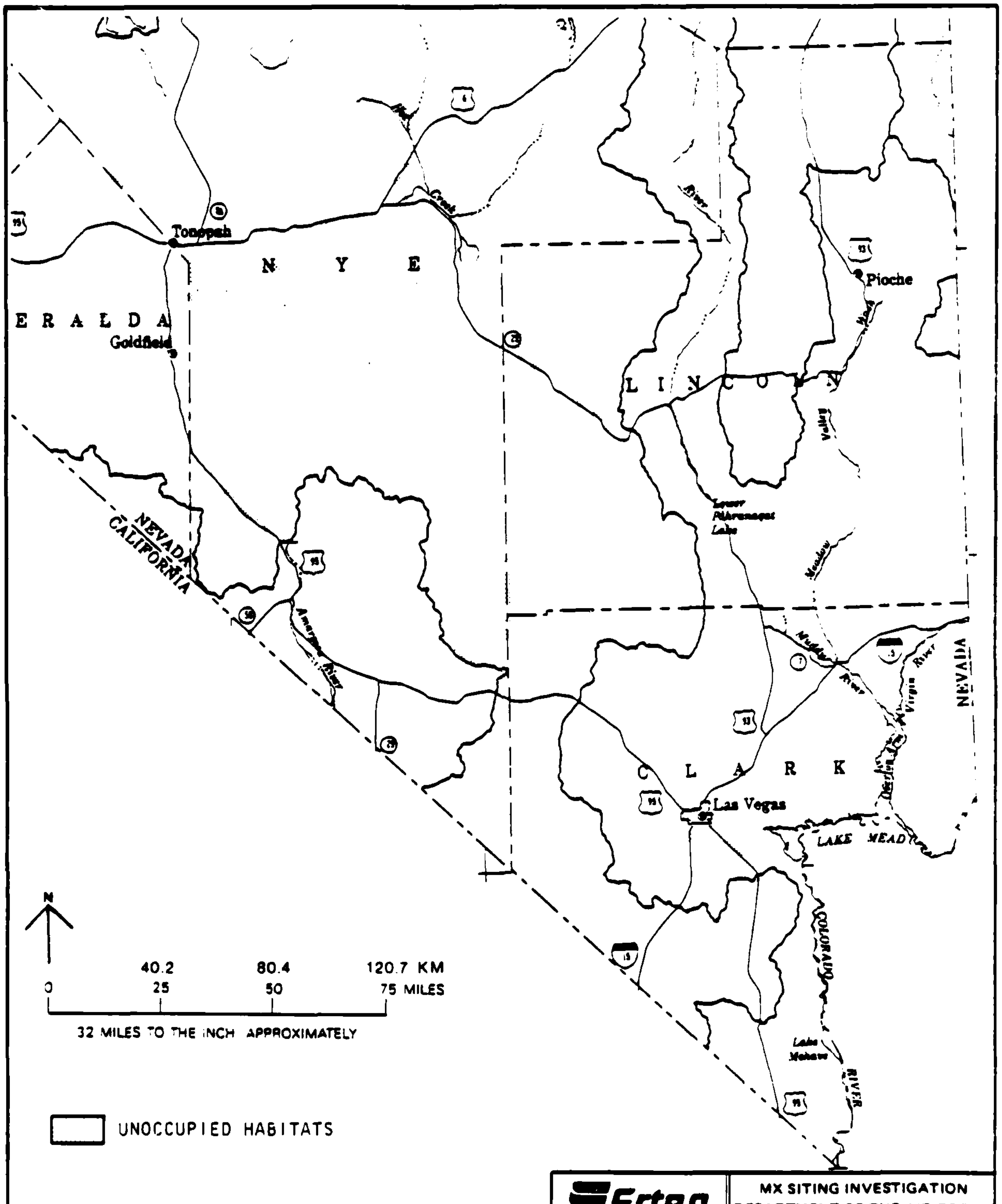
GRAY FOX DISTRIBUTION
IN SOUTHER NEVADA

FIGURE 2-6



SOURCE: NEVADA DEPT. OF WILDLIFE, 1980

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BOBCAT DISTRIBUTION IN SOUTHERN NEVADA

FIGURE 2-7

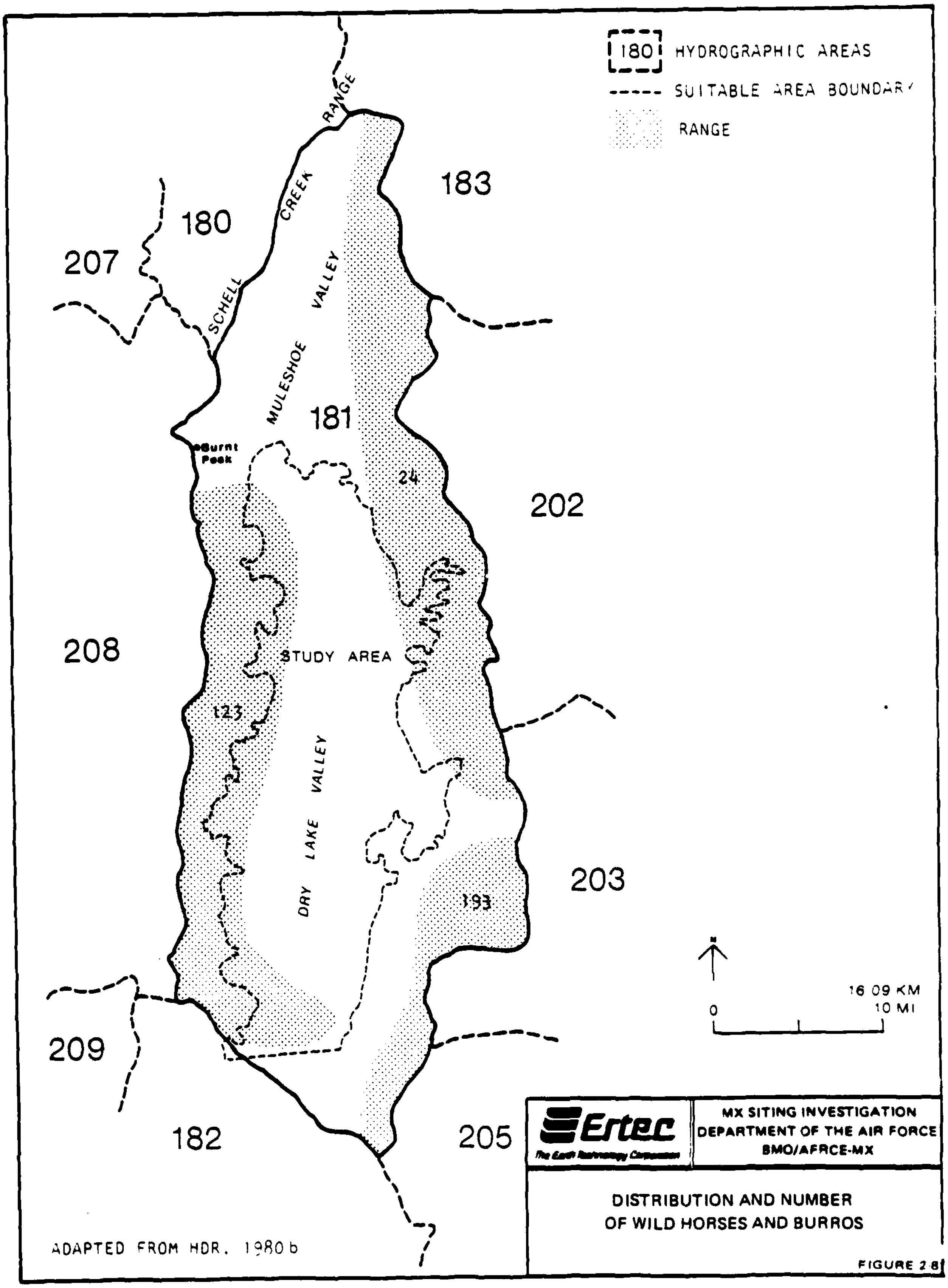
contained 24 animals, the western portion 123, and the south-eastern portion 193. These herds roam mainly on the slopes and in the mountains. They do not usually use the valley bottoms, but portions of their range are located in eastern and western edges of the study area. Their expected distribution is shown in Figure 2-8.

2.3.4.8 Raptors

The bald eagle (Haliaeetus leucocephalus) and American peregrine falcon (Falco peregrinus anatum) are federally classified as endangered (U.S. Fish and Wildlife Service, 1980). Bald eagles are not normally found in Dry Lake Valley, but a wintering population is known in Pahranagat Valley to the south, and fall migration through Dry Lake Valley may occur.

Small numbers of peregrine falcons migrate through the study area in the fall and spring. The peregrine feeds on birds, especially waterfowl and shorebir s. Cliffs near permanent waterways are preferred nesting habitat. The decline in the peregrine population is attributed to pesticide poisoning of its food source and illegal capture by falconers (White, 1981). The status of the peregrine in Dry Lake Valley is not well known. It is documented in the area as a migrant, but no nesting has been reported in the surrounding mountain ranges (Herron, 1980).

The ferruginous hawk (Buteo regalis) is classified as a sensitive species by the Bureau of Land Managment and Nevada Department of Wildlife (Molini, 1980). The northern tip of Dry Lake



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DISTRIBUTION AND NUMBER
OF WILD HORSES AND BURROS

FIGURE 2.8

Valley is the southernmost portion of the breeding range of the ferruginous hawk, but migrants may pass through the valley. Prey is similar to that of the red-tailed hawk and includes pocket gophers, ground squirrels, rabbits, and reptiles. Juniper trees that occur along the foothills of ranges are the preferred nesting sites. These hawks are sensitive to human disturbance, especially during the nesting season, and activities as far as 1300 feet (400 m) from the nest may cause stress (White, 1981).

The golden eagle (Aquila chrysaetos), a federally protected species, winters throughout Nevada, primarily in desert valleys. Their principal prey is the black-tailed jackrabbit.

The northern harrier (Circus cyaneus), a protected species, is common throughout the valley in winter and is especially abundant during fall migrations. These birds prey upon small mammals and reptiles.

Raptor nesting is known to occur along the rocky ledges in the mountain ranges bordering Dry Lake Valley. The valley floor and foothills are used for hunting and are a vital part of the bird's total habitat.

A raptor survey of Dry Lake Valley indicates general raptor use as being above average as compared to other valleys in the MX deployment area (Murphy and White, 1980). Table 2-7 gives a comparison of survey results for the three IOC valleys.

Valley	State	% of Valley Surveyed	No. Species Nesting (No. nests observed)	Raptor Density(b)	Prey Base (Quantity)	Prey Base (Diversity)	Raptor Use Rating(c)
Dry Lake	NV	40	6 (5)	moderate	fair	good	4
Pine (north)	UT	30	4 (5)	sparse	average	average	3
Pine (south)	UT	80	2 (0)	low	low	poor	2
Wah Wah	UT	80	6 (21)	moderate	average	average	3-4

(a) Source: Murphy and White, 1980.
(b) As compared to other valleys in the MX-system.
(c) Based on scale of 1 to 5, where 1 is very poor and 5 is excellent.

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RAPTOR USE COMPARISON
FOR THE IOC VALLEYS

TABLE 2-7

The BLM has studied the eastern Nevada fall raptor migration. (Millsap, 1981). Preliminary results indicate that the valleys immediately adjacent to Pioche are used during migration by over 14 species of hawks and falcons, including the endangered bald eagle and the American peregrine falcon. Accipiters (sharp-shinned and cooper's hawks) are the most abundant group migrating through, comprising 60 percent of the total; buteos, especially the red-tailed hawk, are next in numbers. Although the birds are in migration, they depend on the valley floor for hunting.

Predator-prey relationships have been documented for many raptor species. Woffinden and Murphy (1977) observed declines in ferruginous hawk populations associated with declining black-tailed jackrabbit populations. Nesting success and Townsend ground squirrel availability have been correlated for the prairie falcon (Collopy, 1978), and a decline in golden eagle reproduction has been correlated to a decline in black-tailed jackrabbits, their major prey item (Murphy, 1975).

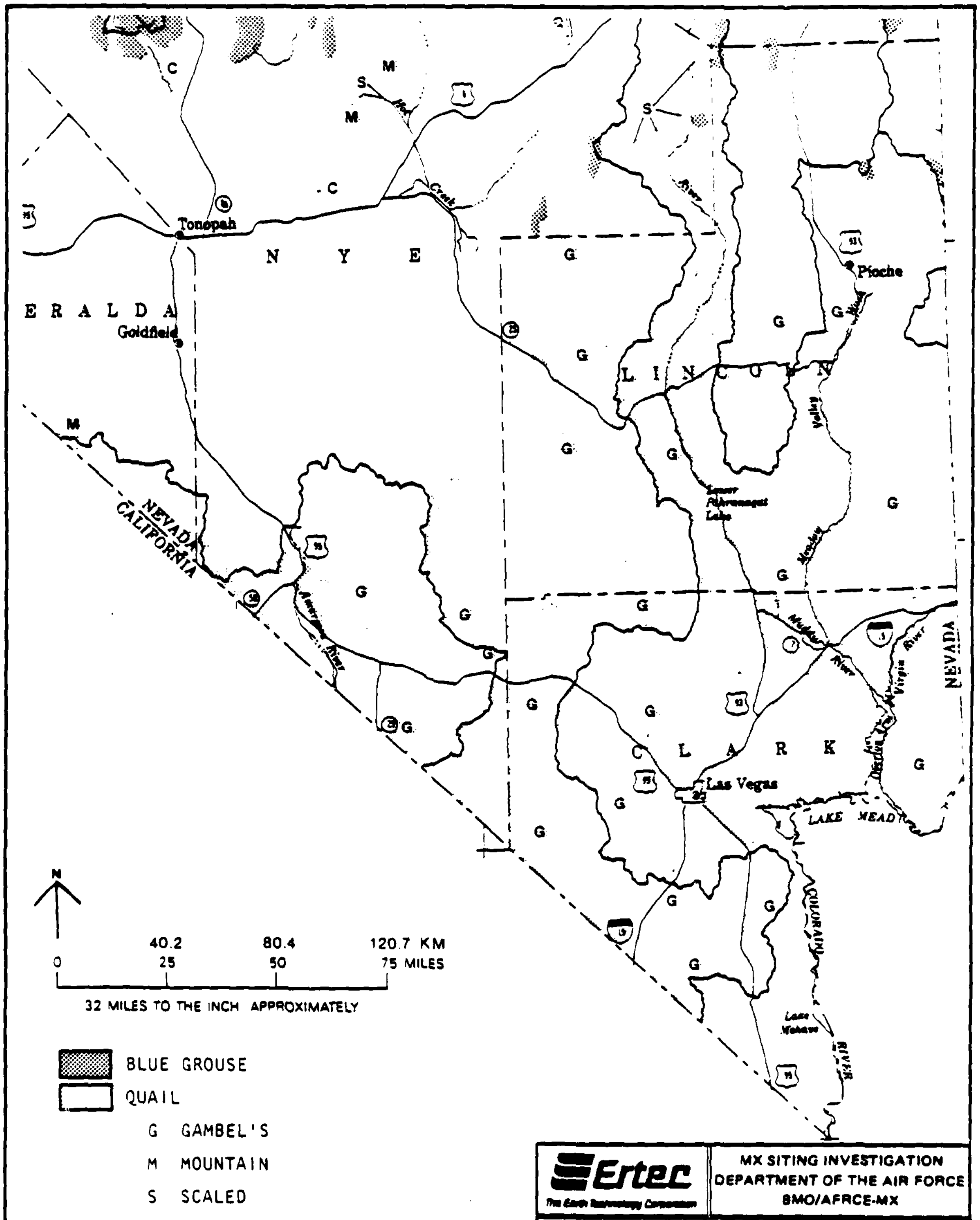
Thus, raptors are subject to indirect impacts because they are high in the food chain and tend to act as indicators of environmental conditions. Any significant impact on the prey base will be reflected by relatively rapid population decline (White, 1981). Although a diversity of prey is taken, some species are more desirable than others. Buteos, such as the red-tailed hawk, have a diverse diet, which allows them to thrive even when a major prey species becomes scarce, but more specialized hawks would be seriously affected. Eagles prefer larger prey such as

jackrabbits, cottontail rabbits, and waterfowl where available. Red-tailed hawks take jackrabbits and cottontails, as well as reptiles and an assortment of rodents and birds. The prairie falcon prefers ground squirrels but will take other small mammals and birds when necessary. A number of these prey species are abundant within Dry Lake Valley.

2.3.4.9 Game birds

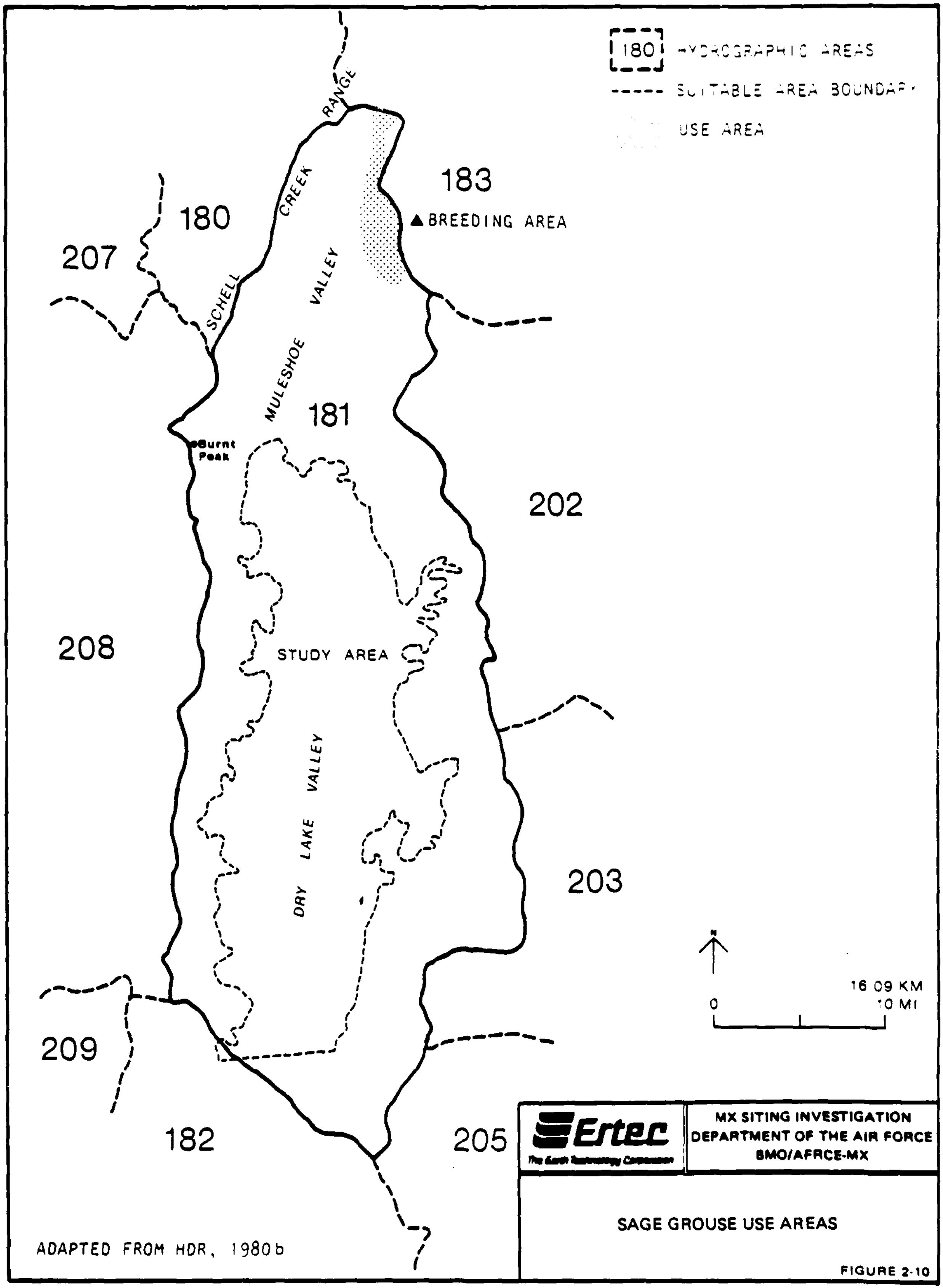
Upland game birds in the study area include Gambel's quail (*Lophortyx gambelii*) and mourning dove (*Zenaida macroura*). Mourning doves are migratory, usually stopping only briefly in Dry Lake Valley during fall migrations. Gambel's quail are native to southern Nevada and occur sparsely in the desert scrub areas of Dry Lake Valley. Blue grouse are also present in various parts of southern Nevada. Distribution of blue grouse and quail are shown on Figure 2-9. The Seesee partridge was introduced northwest of Dry Lake Valley several years ago; the transplant was considered unsuccessful.

Sagebrush is the principal item in the diet of adult sage grouse (*Centrocercus urophasianus*), and sagebrush scrub is the preferred habitat of this species. In spring, male sage grouse perform courting rituals on established strutting grounds, which are usually open grassy areas. Nesting occurs on the ground under sagebrush, and brood-use areas are located where adequate cover and water are found (Braun and others, 1977). As shown in Figure 2-10, the distribution of sage grouse extends into the Dry Lake Valley watershed but not as far south as the study area.



BLUE GROUSE AND QUAIL
DISTRIBUTION IN SOUTHERN NEVADA

FIGURE 2-9



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SAGE GROUSE USE AREAS

FIGURE 2-10

2.3.4.10 Other Wildlife Expected

Dry Lake Valley provides habitat for a number of other wildlife species, including birds, reptiles, mammals, and amphibians. While these species are not classified as endangered or protected, they play vital roles in the ecosystem by serving as important food sources for larger predators such as foxes and raptors. Species expected to occur in the valley are shown in Appendix C.

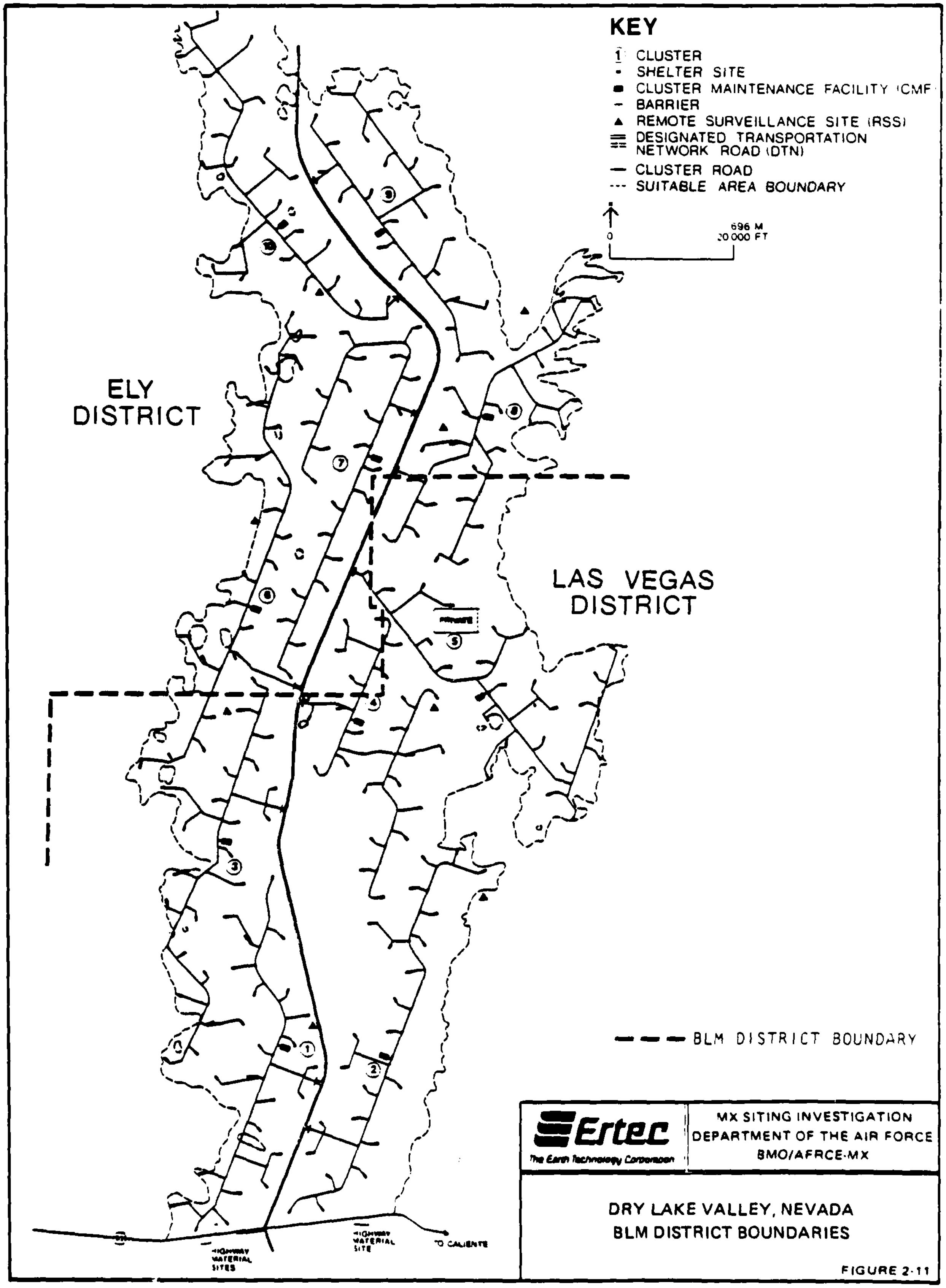
2.4 LAND USE/LAND MANAGEMENT PRACTICES

No state lands occur within Dry Lake Valley. All property is owned by the federal government or private interests.

The federal lands in Dry Lake Valley are managed by the Department of the Interior, Bureau of Land Management (BLM). The northern portion of the valley is managed by the Ely (BLM) District, the southern portion by the Las Vegas (BLM) District. The area boundary of the two districts is shown in Figure 2-11.

The largest parcel of privately owned land (600 acres) is located in eastern Dry Lake Valley just south of the Ely Springs Range. This area is used primarily for grazing and contains no permanent residents. The buildings on the property are used seasonally by ranch hands involved in grazing operations.

The second largest privately owned parcel is located in eastern Dry Lake Valley at Ely Springs. This parcel, which includes approximately 200 acres, is also used for grazing. No structures are present on the property (HDR, 1980a).



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DRY LAKE VALLEY, NEVADA
BLM DISTRICT BOUNDARIES

FIGURE 2-11

The only other private lands within the study area consist of one 80- and one 40-acre parcel, both located in the central portion of northern Dry Lake Valley. They are uninhabited and used solely for grazing (HDR, 1980a).

A mining district, Ely Springs, is located on the east side of Dry Lake Valley, but there is currently no mining activity in the valley.

Grazing is the predominant land use in the valley, and the evidence of grazing activity is pronounced. Water reservoirs and wells have been constructed to provide a water source for the cattle. Disturbance due to the livestock grazing is very high around these areas, and varies from low to moderate in other sections of the valley.

Many roads cross the valley, and off-road vehicle damage is considerable in some areas. Because of the slow vegetation growth in a desert environment, off-road driving often results in long-term damage.

In highly disturbed areas, the vegetation has been invaded by introduced weeds, Halogeton glomeratus, and Russian thistle, (Salsola iberica). The distribution of these species, as found during the field study, is discussed in Section 3.0. Native weedy species, including Astragalus lentiginosus, Machaeranthera canescens, Eriogonum deflexum, and Bromus tectorum, also occupy disturbed areas.

Extent of disturbance due to cattle, off-road vehicle use, and other factors is discussed in Section 3.2.4.

3.0 FIELD SURVEY

3.1 METHODOLOGY

3.1.1 Survey Areas

Three different kinds of construction sites were proposed in Dry Lake Valley: Horizontal Shelter Sites (HSSs), Remote Surveillance Sites (RSSs), and Cluster Maintenance Facilities (CMFs). Shelter sites are arranged in 10 clusters, each containing 23 shelters. Each of the clusters contains one cluster maintenance facility. The five remote surveillance sites are scattered over the valley.

Biological surveys of these sites were conducted from September through December, 1980. Surveys were also conducted during this period on approximately 20 miles (32 km) of Cluster 2 roads and along approximately 40 miles (64 km) of Designated Transport Network (DTN). Table 3-1 summarizes the type and number of facilities surveyed in the three IOC valleys, facility dimensions, and sizes of the biological survey areas.

The area biologically surveyed at each location was much larger than the area expected to be directly impacted by the facility itself. This approach allowed for evaluation of indirect disturbance that might affect adjacent areas during facility construction.

Field survey teams consisted of two biologists usually accompanied by two archeologists. The crews located the study sites by use of a 1:62,500 topographic base map illustrating the cluster layout for the entire valley, as shown in Figure 1-2.

Type Facility	Number of Facilities Surveyed[b]		Facility Dimensions (feet)	Biological Survey Area (feet)
Horizontal Shelter Sites (HSSs)	Dry Lake	230	265 x 410	665 x 810
	Pine	115		
	Wah Wah	115		
Cluster Maintenance Facilities (CMFs)	Dry Lake	10	250 x 700 and 250 x 740	750 x 1,140
	Pine	5		
	Wah Wah	5		
Remote Surveillance Sites (RSSs)	Dry Lake	5	100 x 100	300 x 300
	Pine	4		
	Wah Wah	4		
Designated Transport Network (DTN)	Dry Lake	39 miles	75' Right-of-Way	75 feet on each side of centerline
	Pine	0		
	Wah Wah	0		
Cluster Roads	Dry Lake (Cluster 2)	26 miles	75' Right-of-Way	75 feet on each side of centerline
	Pine	0		
	Wah Wah	0		

(a) See Volume II, Part II for report on Pine and Wah Wah valleys.
(b) Does not include resitings.

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TYPE, NUMBER, AND DIMENSIONS OF FACILITIES SURVEYED IN IOC VALLEYS (a)

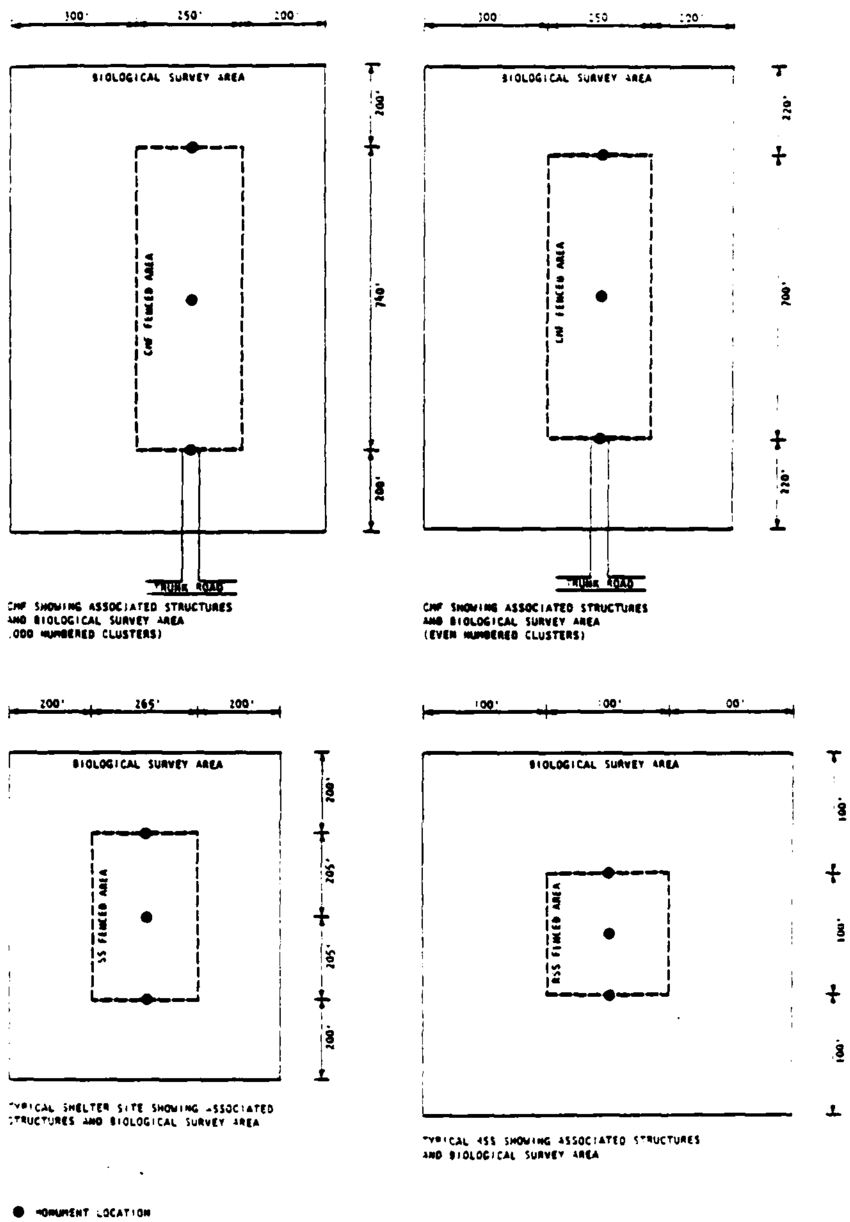
TABLE 3-1

Once in the general area of the site, 1:9600 (1" = 800') topographic maps were used to determine precise site locations.

The centerline of the environmental survey area was identified by cadastral survey. Because only the centerline was marked by the surveyors, the perimeters of the survey areas were identified by the field crew prior to conducting the survey. This procedure usually consisted of measuring the appropriate distances from the cadastral survey monuments to the survey perimeters and then establishing the corners with a right-angle prism. Measurements were made with metric-calibrated hip chains. Because the dimensions of HSS, CMF, and RSS units and the road networks vary, the procedures used to establish and transect sample survey areas are discussed separately for each below.

Shelter sites were identified on the ground by three capped rebar survey monuments and temporary survey stakes. The three survey monuments lie 205 feet (62 m) apart along the centerline of the long axis of each shelter site. The monument designating "the true point of beginning" (TPB), that is, the junction of the fence of the shelter and the branch access road, is stamped with an arrow pointing into the shelter. Monument locations are shown in Figure 3-1.

The biological survey area for each shelter site was 665 feet (203 m) by 810 feet (247 m), and encompassed 12.36 acres (5 ha). The corners of the survey area were flagged. First, a flag was placed along the centerline of the unit, 200 feet (61 m) from either the TPB or the end survey monument. Then a flag was placed at both corners 332.5 feet (101 m) out from and



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MX FACILITY LAYOUTS
AND BIOLOGICAL SURVEY AREAS

FIGURE 3-1

at right angles to the centerline flag. The procedure was then repeated for the other end of the survey unit. The layout of the survey area is illustrated in Figure 3-1.

After the perimeters of the survey were located and flagged, the two biologists systematically examined the area for biological resources by walking at 81-foot (25-m) intervals along the long axis of the unit. Specific transect placement within shelter survey units was determined in advance so that data could be recorded on specially designed shelter sample unit map forms.

Remote surveillance site locations were identified by three capped rebar monuments and adjacent temporary survey stakes located 50 feet (15 m) apart. The survey area for each of the RSS sample units was 300 feet by 300 feet (91 m by 91 m), encompassing 2.06 acres (1 ha). The corners were marked by first placing a flag along the centerline 100 feet (30 m) out from the end monument. Corner flags were then placed 150 feet (46 m) out from and at right angles to the centerline flag. The layout of the RSS survey area is illustrated in Figure 3-1.

Cluster maintenance facility locations were identified by three capped rebar survey monuments and adjacent temporary survey stakes placed along the long axis of the CMF but offset from the survey area centerline. The survey area for each CMF was 750 feet by 1140 feet (229 m by 348 m), and encompassed 19.6 acres (8 ha). Although even-numbered and odd-numbered CMFs

were different sizes, the same survey areas were inspected for both types. Monuments were located 370 feet (113 m) apart for the even-numbered CMFs and 350 feet (107 m) apart for the odd-numbered CMFs.

The corners of the even-numbered CMF survey areas were located by first placing a flag in line with the survey monuments 200 feet (61 m) out from TPB monument at the branch road end of the unit. Then, facing into the unit, the right hand corner was placed out 325 feet (99 m) and the left hand corner was placed out 425 feet (130 m), both at right angles to the monument line. The procedure was then repeated in mirror image for the other end of the CMF. The same basic procedure was followed for the odd-numbered CMFs except that the distance measured from the TPB monument to the flag was 220 feet (67 m) instead of 200 feet (61 m) to compensate for the shorter distance between survey monuments. The layouts of both types of CMFs are illustrated in Figure 3-1.

The DTN and Cluster 2 road locations were marked by temporary survey stakes spaced at approximately 0.25-mile (0.4 km) intervals. Changes in road location were indicated by larger, flagged stations called Points of Intersection (PIs). The width of the survey area along road right-of-way was 150 feet (46 m). Roads were inspected by two biologists walking approximately 81 feet (25 m) apart, each 40.6 feet (12 m) from the road centerline, along the entire length of the DTN and Cluster 2 roads.

The archeologists' discovery of a large, prehistoric temporary campsite on the originally proposed DTN route required relocation of 5.5 miles (9 km) of the DTN. The road was subsequently moved to the west, marked with survey stakes, and surveyed.

Each facility site was numbered to eliminate confusion of the data. Site MX-181-SS 3/16, for example, indicates Shelter Site 16 in Cluster 3, Dry Lake Valley (nydrographic area 181).

3.1.2 Traverses

After establishment of the survey area perimeter, a visual assessment of the biotic and abiotic conditions was conducted at each site. Crew members walked a series of parallel traverses at approximately 81-foot (25-m) intervals, the entire length of the survey area. The number and distance between traverses varied with the type of facility; these are summarized in Table 3-2.

While traversing the survey area, the field crew recorded significant abiotic factors such as slope, elevation, disturbance, and soil characteristics, as well as all identifiable vegetative and wildlife components on standardized data forms. Threatened and endangered plants and threatened and endangered wildlife signs and sightings were mapped on a metric grid sheet to document their locations within the shelter site so that they could be easily relocated in the future if necessary.

Relatively few animals were observed during the field survey; some use the area on only a seasonal basis, many are nocturnal,

Facility Type	Number of Traverses	Approximate Distance between Traverses
Shelter Site (HSS)	8	83 ft (25 m)
Cluster Maintenance Facility (CMF)	10	72 ft (22 m)
Remote Surveillance Site (RSS)	4	75 ft (23 m)
Designated Transportation Network (DTN) and Cluster Roads	2	72 ft (22 m)

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TRAVERSE PROCEDURES
FOR MX FACILITIES

TABLE 3-2

and most hide when humans approach. The field crew, therefore, identified a number of mammals from tracks, burrow construction, fur, scat, and other signs.

Special data forms were prepared to record additional information on important plant and wildlife species within or adjacent to a survey area. Any threatened and endangered species encountered were photographed (when possible), and data concerning their location, population, and habitat were recorded. Examples of all biological data forms used in the survey are given in Appendix D.

3.1.3 Line-Intercept Survey

The line-intercept method, used in the surveys, is a standard technique used in vegetation analysis (Canfield, 1941; and Van Dyne, 1960). A transect tape is placed over an area, and number and species of organisms intersecting the line are tabulated. The distance of line covered by each species is then calculated. This method was chosen because quantitative measurements can be obtained in a much shorter period of time than by the use of quadrants.

To obtain data on percent cover and density, two 163-foot (50-m), line-intercept transects were completed within each shelter site and cluster maintenance facility area. Transects were placed in the vicinity of the two end monuments, in areas considered to contain vegetation representative of the area. One transect was placed to the east and one to the west of the monuments. In study areas having two vegetation types, one transect was placed

in each vegetation type regardless of monument locations. When this occurred, the transect locations were mapped on a metric grid in the record form.

Due to the smaller survey area, only one 163-foot (50-m) transect was laid in each RSS study area. This transect was always laid to the north or south of monument 1, the true point of beginning.

During the DTN and cluster road survey, transect data were collected at 5-mile (8-km) intervals on a line perpendicular to the proposed road Right-of-Way. In addition, a species list of flora and fauna was compiled for each 5-mile (8-km) segment of the DTN, and at three similarly spaced locations on the cluster roads.

The distance along the transect line intercepted by each individual plant was recorded to the nearest decimeter on the Sample Unit Vegetation Sheet. Due to the season of the survey, most annual plants were dead. To avoid inconsistent results, only perennial plants were included in the transect data. Percent total perennial cover, percent relative cover, density, and percent relative density were calculated. These parameters have been described by Smith (1974) and were calculated from the following equations:

$$\text{total cover}(\%) = \frac{\text{total plant cover (dm)}}{\text{distance of transect (dm)}} \times 100 \qquad (3.1.3\text{-}1)$$

$$\text{relative cover of species A}(\%) = \frac{\text{total cover of species A (dm)}}{\text{total cover of all species (dm)}} \times 100 \qquad (3.1.3\text{-}2)$$

Density may be calculated in several ways, and the problems associated with the definition of density have been outlined by Strickler and Sterns (1963). According to Smith (1974), density and relative density are defined as:

$$\text{density of species A} = \frac{\text{number of individuals of species A}}{\text{distance of transect (dm)}} \qquad (3.1.3\text{-}3)$$

$$\text{relative density of species A(\%)} = \frac{\text{number of individuals of species A}}{\text{number of individuals of all species}} \times 100 \qquad (3.1.3\text{-}4)$$

Data obtained at each study site were analyzed and correlated with information obtained from the literature and from state and federal agencies (see Section 2.0).

However, due to vegetative propagation, an individual plant is not always easily delineated. As defined by Strickler and Sterns (1963), an individual is the aerial parts of a single root system. Complications arise because what appears to be a multiple-stem shrub above ground, if excavated, may actually be discovered to be two or more plants with individual root systems. Due to this inherent difficulty with density, percent cover was used to define the dominant and subdominant plant species in each biological survey area.

3.1.4 Voucher Collection

Voucher specimens were collected from each vegetation association in the survey area and pressed in a standard plant press. The specimens were mounted on herbarium sheets and labelled with the collector's name, date of collection, habitat, and elevation.

Species not identifiable in the field were collected for examination at the University of Nevada herbarium in Reno. In some cases, specimens were sent to an expert when taxonomic difficulties arose. However, due to the season of the survey, many plants did not have flowers or reproductive structures necessary for positive species identification.

Collections of sensitive, Currently Listed, or Currently Under Review plants were taken only from populations that exceeded 20 individuals, or in cases when field identification was uncertain.

Voucher specimens have been stored at Ertec Northwest in Seattle, and duplicate collections were submitted to the University of Nevada herbarium in Reno.

3.1.5 Trapping

Trapping was initiated to obtain additional information on the smaller mammals which serve as prey for raptors and other predators.

A permit to trap small rodents was obtained from the Nevada Department of Wildlife. Sherman live traps were baited with oatmeal and peanut butter, and cotton was placed inside to decrease rodent mortality rate during the cold nights. Trap lines were set at night in major vegetation associations. The following morning, the traps were examined, a species inventory compiled, and the animals released. Voucher specimens were not collected, and no mortality occurred during trapping.

3.1.6 Vegetation Mapping

Since existing vegetation maps developed by the BLM sometimes lack detail or contain uncertainties, it was decided that additional maps based on quantifiable data were necessary. The vegetation associations in the valley were mapped by NRC, Inc. of Reno, Nevada, using aerial photography interpretation. The IOC valleys were photographed by Ertec Airborne Systems (formerly Fugro Geometrics) in 1978 and 1979 at a scale of 1:25,000. The dominant and subdominant vegetation species were determined from the field data, and the aerial photographs were interpreted and the field data extrapolated to obtain a vegetative map for the valley. BLM maps were used in some instances to supplement the field data and photo interpretation in questionable areas. Portions of the map showing individual clusters are found in Section 3.0, and a map showing the entire valley is given in Appendix I.

3.1.7 Photography

A 35-mm color slide was taken from the southwest corner of each survey area. The site number, date, photographer's initials, roll number, and frame were recorded on a photographic record form. This information was also displayed on a clipboard placed in one corner of each area photographed. Slides are filed at the Ertec Northwest office in Seattle.

Sensitive, threatened, or endangered plant and wildlife species were also photographed. A close-up photo of the species, as well as a photograph of the surrounding habitat, was taken where possible.

3.1.8 Field Journals

A journal was maintained by each crew member and survey conditions, procedural deviations, unusual findings, and any other factors affecting the survey were documented. This information was used in subsequent analysis and interpretation of the information gathered in the field.

3.1.9 Off-Road Travel

Permission was obtained from the BLM for limited off-road driving as necessary, but due to the damage that can be inflicted and the slow growth and recovery rates of desert vegetation, travel by field crews was limited to existing trails when possible. When traveling off-road, field crews followed tracks made by the surveyors and created new tracks only when trails or previous tracks to the study area could not be located.

3.2 RESULTS AND DISCUSSION

3.2.1 Overview of Plant Communities

This section presents an overview of vegetation observed within the valley during the survey. A cluster-by-cluster discussion is provided in Section 3.2.5.

Xerophytic plant communities in desert regions are usually composed of three basic plant types: ephemerals (annuals); succulent perennials; and non-succulent perennials that have evolved drought-resistant adaptations (Daubenmire, 1974).

The vegetation of Dry Lake Valley is made up of xerophytic communities in which shrubs or shrubs and perennial grasses

are the dominant plants. From the field data, species dominance was determined on the basis of percent cover of each species. Annuals may comprise a large portion of the Dry Lake communities in the spring and early summer months. Due to the time of the field investigation (September though December), the percent cover of annuals could not be determined. Despite the time of year, however, the presence of some annual species was noted, but complete identification and determination of range extension were not always possible.

In Dry Lake Valley, succulents were represented by six members of the cactaceae family: Coryphantha vivipara, Echinocereus engelmannii, Sclerocactus pubispinus, Opuntia erinacea, Opuntia polycantha, and Opuntia echinocarpa. These species were widely scattered and comprised less than one percent of the cover within the study areas.

The data obtained from approximately 500 transects on nearly 250 sites clearly indicate the dominance of perennial grasses and shrubs at the time of the study. The percent perennial cover averaged from both transects at each shelter site is shown by cluster in Table 3-3. The average cover ranged from a low of 3.5 percent at Site 5/13 to a high of 42.9 percent an Site 10/21. The average percent cover of perennial species on shelter sites in Dry Lake Valley was approximately 23 percent.

A comparison of the range and average cover in each cluster is shown in Table 3-4. Because facility locations were selected

Average Cover in Percent

Shelter Site	Cluster 1	2	3	4	5	6	7	8	9	10
1	37.8	19.4	31.5	17.6	16.7	20.8	21.1	17.3	22.7	18.3
2	35.3	17.2	25.5	17.8	15.7	25.2	16.2	27.8	19.1	23.7
3	33.3	30.0	19.8	16.3	24.4	24.4	24.0	24.5	24.6	20.7
4	23.5	24.6	19.8	18.4	15.5	33.5	21.3	30.4	23.0	20.1
5	33.2	25.9	25.5	19.1	30.8	17.4	16.3	26.1	21.3	26.7
6	33.1	33.1	16.0	20.8	23.9	19.9	20.4	24.5	25.5	22.7
7	27.4	18.8	23.7	20.2	22.6	27.9	20.3	19.6	26.1	26.2
8	25.3	25.8	17.0	21.5	26.8	21.4	16.6	22.4	18.9	19.7
9	27.7	25.9	26.5	14.7	20.5	14.3	19.8	29.2	20.8	30.8
10	28.3	22.8	22.5	17.7	19.8	15.1	22.2	19.6	16.6	23.1
11	25.9	30.2	27.9	16.9	21.4	16.8	23.3	23.2	21.3	24.3
12	18.5	27.7	29.3	18.9	11.0	26.6	21.7	21.3	25.9	27.1
13	27.4	8.4	26.7	17.9	3.5	16.2	19.5	26.7	21.0	25.0
14	20.3	30.7	30.2	17.9	14.5	25.7	23.1	25.8	24.3	25.2
15	30.1	23.1	17.0	20.4	19.7	29.9	21.8	23.8	29.0	21.2
16	26.9	19.5	32.1	20.4	17.3	27.1	18.2	27.1	32.9	23.8
17	27.1	14.3	22.7	25.3	20.6	24.6	25.6	30.6	31.4	15.4
18	27.1	31.9	22.8	21.3	18.7	25.4	32.3	30.1	25.5	25.4
19	25.7	28.8	16.0	15.7	10.9	26.9	27.4	22.8	30.1	22.8
20	29.6	25.4	23.1	10.4	21.3	32.2	27.2	29.8	25.5	21.0
21	26.5	16.0	24.6	17.6	27.0	27.4	26.6	22.3	21.4	42.9
22	21.5	16.2	26.3	16.9	26.4	33.7	26.4	24.2	18.1	26.5
23	34.6	9.4	20.5	22.9	27.2	20.9	18.9	33.2	14.8	25.0

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AVERAGE PERCENT PERENNIAL
COVER IN DRY LAKE SHELTER SITES

TABLE 3-3

	Cluster 1	2	3	4	5	6	7	8	9	10
HIGH	37.8	33.1	32.1	25.3	30.8	33.7	32.3	30.6	32.9	42.9
LOW	18.5	8.4	16.0	10.4	3.5	14.3	16.3	17.3	14.8	15.4
AVERAGE	28.6	22.9	23.8	18.7	20.0	24.0	21.8	25.8	23.3	24.2

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RANGE AND AVERAGE PERCENT
PERENNIAL COVER BY CLUSTER

TABLE 3-4

for specific geologic and topographic conditions, the shelter and CMF sites cannot be considered a random sample of the valley. Thus, cover observed on the shelter and CMF sites may not be representative for the remainder of the valley. For example, the playa, which contained no biological survey areas, was devoid of vegetation.

All coverage and density data obtained from the transects are shown in Appendix E. Density and coverage data were not always closely correlated. Examples of this are evident from Cluster 3, Transect 1, Shelter Sites 21, 22 and 23, as shown in Table 3-5. At Shelter Site 23, the relative cover of winterfat (Ceratoides lanata) was 86.8 percent, while the relative density was 51.3 percent. At the same site, the relative cover of Hilaria jamesii was only 8.4 percent while the relative density was 39.1 percent. Thus, dominance in terms of aerial coverage may differ significantly from dominance determined by number of individuals (density).

Dominant plant species were determined from transect results. Four major vegetation zones are present in Dry Lake Valley: (1) sagebrush (Artemisia) communities; (2) sagebrush/shadscale (Atriplex) transitional communities; (3) shadscale communities; and (4) shadsale/southern desert transitional communities. Of these four groups, the shadscale is by far the most common, having 42 different dominant and subdominant associations that cover an estimated 128,879 acres (52,156 ha), approximately 61 percent of the study area. Dominant associations and their acreage within the study area are summarized in Table 3-6.

Biological Survey Area	Plant Species*	Transect 1 Cover (dm)	Rel. Cover (%)	Total Cover (%)	# Plants	Density (#/100 dm)	Rel. Density (%)
MX SS 3/21	ATCA	27.8	20.4	5.6	6	1.2	9.5
	CELA	45.1	33.1	9.0	18	3.6	28.6
	CHGR	8.6	6.3	1.7	2	.4	3.2
	GRSP	12.7	9.3	2.5	2	.4	3.2
	HIJA	42.2	30.9	8.4	35	7.0	55.6
		136.4	100.0	27.2	63	12.6	100.1
MX SS 3/22	CELA	67.5	46.4	13.5	37	7.4	57.8
	GRSP	62.5	43.0	12.5	11	2.2	17.2
	HIJA	10.7	7.4	2.1	11	2.2	17.2
	ORHY	1.9	1.3	.4	2	.4	3.1
	SPAM	.6	.4	.1	1	.2	1.6
	SPCR	2.0	1.4	.4	2	.4	3.1
		145.2	99.9	29.0	64	12.8	100.0
MX SS 3/23	CELA	78.9	86.8	15.8	59	11.8	51.3
	HIJA	7.6	8.4	1.5	45	9.0	39.1
	ORHY	4.4	1.8	.9	11	2.2	9.6
		90.9	100.0	18.2	115	23.0	100.0

ATCA - *Atriplex canescens*
CELA - *Ceratoides lanata*
CHGR - *Chrysothamnus greenei*
GRSP - *Grayia spinosa*
HIJA - *Hilaria jamesii*
ORHY - *Oryzopsis hymenoides*
SPAM - *Sphaeralcea ambigua*
SPCR - *Sporobolus cryptandrus*

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COMPARISON OF PLANT DENSITY AND COVER AT SELECTED SURVEY SITES

TABLE 3-5

Community	Type Number[(a)]	Dominant/ Subdominant Association[(b)]	Acreage[(c)]
Sagebrush Communities	A1	Artr/Epne	17,479
	A2	Artr/Chvi	19,710
	A3	Artr/Hija	2,684
	A4	Artr/Cela	312
	A5	Arno/Tegl	5,564
	A6	Arno/Hija	395
	A7	Come/Arno	1,924
	A8	Gusa/Arno	1,037
	A9	Arno/Epne	220
	A10	Artr/Arno	1,801
Total			51,126
Sagebrush/Shadscale Transitional Communities	B1	Grsp/Artr	320
	B2	Epne/Grsp	2,110
	B3	Grsp/Chvi	5,482
	B4	Chvi/Grsp	5,092
	B5	Grsp/Hija	1,673
	B6	Grsp/Epne	1,477
	B7	Epne/Chvi	457
	B8	Chvi/Hija	276
	B9	Epne/Hija	4,148
	B10	Chvi/Epne	292
Total			21,327
Shadscale Communities	C1	Cela/Chgr	17,435
	C2	Cela/Atca	8,542
	C3	Cela/Hija	6,150
	C4	Cela/Grsp	4,831
	C5	Cela/Orhy	1,511
	C6	Cela/Spcr	1,844
	C7	Cela/Arsp	4,246
	C8	Chgr/Cela	4,596
	C9	Atco/Cela	16,216
	C10	Hija/Cela	2,734
	C11	Atca/Cela	3,269
	C12	Atco/Grsp	107
	C13	Atco/Arsp	5,488
	C14	Atco/Koam	3,708
	C15	Atco/Sihy	500
	C16	Chgr/Tegl	1,038
	C17	Chgr/Orhy	1,431
	C18	Chgr/Epne	3.480
	C19	Chgr/Atco	6,460

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SUMMARY OF VEGETATION ZONES AND DOMINANT/SUB-DOMINANT ASSOCIATIONS OBSERVED IN DRY LAKE VALLEY, NEVADA

 TABLE 3-6

Community	Type Number[a]	Dominant/ Subdominant Association[b]	Acreage[c]
Shadscale Communities (Cont.)	C20	Tegl/Epne	753
	C21	Tegl/Hija	1,003
	C22	Lyan/Hija	818
	C23	Gumi/Chgr	964
	C24	Save/Atco	3,191
	C25	Hija/Chgr	1,341
	C26	Gumi/Epne	590
	C27	Hija/Spcr	335
	C28	Epne/Tegl	1,247
	C29	Gutr/Chgr	989
	C30	Hija/Cela	1,028
	C31	Tegl/Chgr	1,219
	C32	Chgr/Hija	675
	C33	Atco/Gusa	2,469
	C34	Tegl/Cela	1,073
	C35	Hija/Orhy	1,495
	C36	Gumi/Hija	505
	C37	Chgr/Atca	2,565
	C38	Atca/Orhy	781
	C39	Grsp/Cela	563
	C40	Cela/Atco	5,713
	C41	Save/Atco/Koam	2,265
	C42	Grsp/Chgr	3,441
Total			128,879
Shadscale/Southern Desert Transitional Communities	D1	Yubr/Grsp	2,189
	D2	Yubr/Tegl/Hija	1,343
	D3	Yubr/Artr/Chvi	172
Total			3,704
Playa		No vegetation	4,944
Total Acreage			209,980

(a) Types mapped in Figures 3-24 through 3-33.
(b) Determined by coverage data from transects. Key on p. 3-21.
(c) Determined by planimetry and aerial photo interpretation.

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SUMMARY OF VEGETATION ZONES AND DOMINANT/SUB-DOMINANT ASSOCIATIONS OBSERVED IN DRY LAKE VALLEY, NEVADA

PAGE 2 OF 3

TABLE 3-6

Symbol	Scientific Name	Common Name
Arno	Artemesia nova	black sagebrush
Artr	Artemesia tridentata	big sagebrush
Atca	Atriplex canescens	fourwing saltbush
Atco	Atriplex confertifolia	shadscale
Cela	Ceratoides lanata	whitesage (winterfat)
Chgr	Chrysothamnus greenei	Greene's rabbitbrush
Chvi	Chrysothamnus viscidiflorus	Douglas rabbitbrush
Come	Cowania mexicana	cliffrose
Epne	Ephedra nevadensis	Mormon tea
Grsp	Grayia spinosa	spiny hopsage
Gumi	Gutierrezia microcephala	threadleaf snakeweed
Gusa	Gutierrezia sarothrae	broom snakeweed
Hija	Hilaria jamesii	galleta grass
Koam	Kochia americana	green molley
Lyan	Lycium andersonii	Anderson wolfberry
Orhy	Oryzopsis hymenoides	Indian ricegrass
Save	Sarcobatus vermiculatus	greasewood
Sihy	Sitanion hystrix	squirreltail grass
Spcr	Sporobolus cryptandrus	sand dropseed
Tegl	Tetradymia grabrata	littleleaf horsebrush
Yubr	Yucca brevifolia	Joshua tree

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SUMMARY OF VEGETATION ZONES AND DOMINANT/SUB-DOMINANT ASSOCIATIONS OBSERVED IN DRY LAKE VALLEY, NEVADA

TABLE 3-6

The variety of dominant species in Dry Lake Valley demonstrates that distribution of vegetation is determined by microhabitats and microclimates. This observation is especially apparent when comparing the species occurring in the proposed shelter sites bordering the playa in Cluster 2 with those found in the northern end of Cluster 9. Pure stands of greasewood (Sarcobatus vermiculatus) found in Cluster 2 are characteristic of the shadscale vegetative zone. However, the species in Cluster 9 are characteristic of the sagebrush vegetation zone. These species include big sage (Artemesia tridentata), green rabbitbush (Chrysothamnus greenei), Douglas rabbitbush (Chrysothamnus viscidiflorus), and hop sage (Grayia spinosa).

Table 3-7 lists all plant species observed on Dry Lake Valley survey sites. Detailed species lists for vegetation and dominant and subdominant types are described by cluster in Section 3.2.5.

3.2.2 Threatened and Endangered Plant Species

The field investigations revealed the presence of Sclerocactus pubispinus and Corypantha vivipara in the study area. Distribution of these species within the study sites is shown in Figure 3-2.

Only one individual of S. pubispinus, the Great Basin fishhook cactus, was observed in the valley. A study of this species in Nevada indicates that it is decreasing in numbers and probably in range (Harrison, 1980). Threats to the existence of this

Agavaceae
- *Yucca baccata*
- *Yucca brevifolia*

Asteraceae (Compositae)
- *Acamptopappus* sp.
- *Ambrosia acanthicarpa*
- *Ambrosia eriocentra*
- *Artemisia nova*
- *Artemisia spinescens*
- *Artemisia tridentata*
- *Artemisia* sp.
- *Aster* sp.
- *Baileya pleniradiata*
- *Chaenactis* sp.
- *Chrysothamnus greenei*
- *Chrysothamnus nauseosus*
- *Chrysothamnus viscidiflorus*
- *Chrysothamnus* sp.
- *Erigeron* sp.*
- *Gutierrezia microcephala*
- *Gutierrezia sarothrae**
- *Gutierrezia* sp.*
- *Haplopappus* sp.*
- *Hymenoclea salsola*
- *Iva axillaris*
- *Machaeranthera canescens**
- *Machaeranthera grindeloides* var. *depressa*
- *Machaeranthera* sp.
- *Pectis papposa*
- *Psathyrotes annua*
- *Senecio* sp.*
- *Stephanomeria* sp.
- *Tetradymia axillaris*
- *Tetradymia glabrata*
- *Tetradymia spinosa*
- *Viguiera multiflora*

Boraginaceae
- *Cryptantha* sp.*
- *Lappula occidentalis*
- *Lappula* sp.

Brassicaceae (Cruciferae)
- *Caulanthus crassicaulis*
- *Caulanthus pilosus*
- *Descurainia pinnata*
- *Descurainia* sp.
- *Lepidium montanum**
- *Lepidium* sp.*
- *Sisymbrium* sp.
- *Stanleya pinnata*
- *Streptanthus cordatus*

Cactaceae
- *Coryphantha vivipara**
- *Echinocereus engelmannii**
- *Opuntia echinocarpa*
- *Opuntia erinacea*
- *Opuntia* sp.*
- *Sclerocactus pubispinus***
- *Mammillaria* sp.*

Caprifoliaceae
- *Symphoricarpos* sp.

Chenopodiaceae
- *Atriplex canescens*
- *Atriplex confertifolia*
- *Ceratoides lanata*
- *Grayia spinosa*
- *Halogeton glomeratus*
- *Kochia americana*
- *Salsola iberica*
- *Salsola* sp.
- *Sarcobatus vermiculatus*
- *Suaeda torreyana*

Cupressaceae
- *Juniperus osteosperma*

Ephedraceae
- *Ephedra nevadensis*

* Varieties or species of these genera are Currently Listed or Listed as Taxon Currently or Under Review in the Federal Register, but species or variety of the plants in Dry Lake could not be positively identified during season of survey.

** Designated as a Taxon Currently under Review in the Federal Register.

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PLANT SPECIES OBSERVED IN DRY LAKE SURVEY AREAS

PAGE 1 OF 2 TABLE 3-7

AD-A113 182 ERTEC WESTERN INC. LONG BEACH CA F/G 6/3

FIELD SURVEYS, IOC VALLEYS. BIOLOGICAL RESOURCES SURVEY, DRY LA--ETC(U)

AUG 81 F04704-80-C-0006

UNCLASSIFIED E-TR-48-VOL-2-PT-1 NL

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1.0 2.8 2.5
2.2
1.1 2.0
1.8
1.25 1.4 1.6

Euphorbiaceae
Euphorbia sp.

Fabaceae (Leguminosae)
Astragalus lentiginosus*
Astragalus sp.*
Lupinus sp.*

Hydrophyllaceae
Phacelia sp.*

Lamiaceae

Salvia dorrii

Liliaceae
Calochortus sp.

Linaceae
Linum perenne
Marrubium vulgare

Loasaceae
Mentzelia sp.*

Malvaceae
Sphaeralcea ambigua
Sphaeralcea grossulariifolia
Sphaeralcea sp.*

Nyctaginaceae
Mirabilis sp.

Onagraceae
Camissonia sp.*
Oenothera sp.*

Poaceae (Graminae)
Aristida purpurea
Aristida sp.
Bouteloua gracilis
Bouteloua sp.
Bromus rubens
Bromus tectorum
Erioneuron pulchellum
Erioneuron pilosum
Hilaria jamesii
Muhlenbergia porteri

Poaceae (Continued)
Oryzopsis hymenoides
Sitanion hystrix
Sitanion jubatum
Sporobolus contractus
Sporobolus airoides
Sporobolus cryptandrus
Sporobolus flexuosus
Sporobolus sp.
Stipa comata
Stipa sp.
Vulpia octoflora

Polemoniaceae
Ipomopsis congesta
Gilia sp.*
Langoilia sp.
Leptodactylon pungens

Polygonaceae
Eriogonum brachypodum
Eriogonum caespitosum
Eriogonum cernuum
Eriogonum deflexum
Eriogonum inflatum
Eriogonum microthecum*
Eriogonum nidularium
Eriogonum sp.*
Oxytheca perfoliata

Ranunculariaceae
Delphinium sp.

Rosaceae
Cowania mexicana
Fallugia paradoxa
Prunus fasciculata

Scrophulariaceae
Castilleja sp.*
Mimulus sp.
Penstemon palmeri
Penstemon sp.*

Solanaceae
Lycium andersonii

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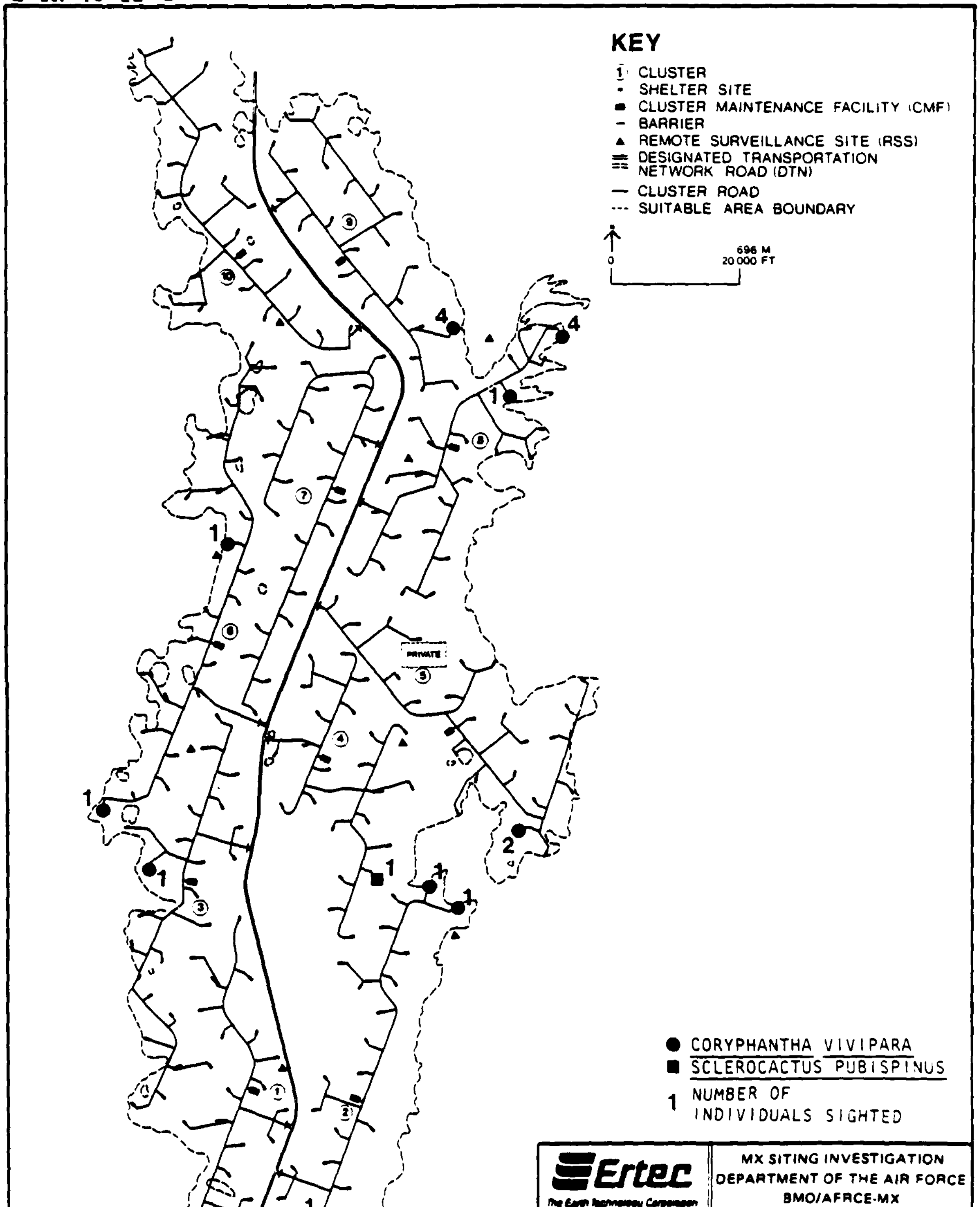
PLANT SPECIES OBSERVED IN
DRY LAKE SURVEY AREAS

PAGE 2 OF 2

TABLE 3-7



FIELD SURVEY RESULTS: TAXA CURRENTLY UNDER REVIEW FOR FEDERAL REGISTER LISTING

FIGURE 3-2

cactus include poaching, trampling by livestock, insect infestations, and rodent foraging. This species is listed as threatened in Nevada on the NNNPS listing, and is a Taxa Currently Under Review in the Federal Register (December 15, 1980). It is considered a Category 1 species, which is defined as a species for which sufficient biological information is available to support the listing of the species as threatened or endangered but for which development of final rules will require several years. Plants in Category 1 are to be considered in environmental planning (Federal Register, 1980).

Populations of one to four individuals of Coryphantha vivipara, the pincushion cactus, were observed scattered throughout Dry Lake Valley. The variety of this species is thought to be rosea, although positive identification was not possible because the plants were not in flower. Threats to the pincushion cactus include grazing, trampling, poaching, biocide application, construction, and other factors. This species is listed as threatened in Nevada on the NNNPS listing and is a Taxa Currently Under Review in the Federal Register (15 December 1980). It is a Category 2 species, which is defined as a species for which a threatened or endangered status is probably appropriate but for which insufficient data are presently available. [illegible] plants are also to be considered in environmental planning (Federal Register, 15 December 1980). Treatment of plant species listed as Currently Under Review is discussed at length in Section 2.3.2.

Although other sensitive, threatened, or endangered plant species may exist in Dry Lake Valley, they may not have been identified because reproductive structures necessary for identification were not present during the season in which the study was conducted.

Individuals of Erigeron, Senecio, Gutierrezia, Haplopappus, Cryptantha, Lepidium, Opuntia, Lupinus, Astragalus, Mentzelia, Gilia, Castilleja, Penstemon, Oenothera, Eriogonum, Sphaeralcea, Phacelia, and a possible Mammillaria were observed within the valley, but species could not be identified. Gutierrezia sarothrae, Machaeranthera canescens, Astragalus lentiginosus, and Eriogonum microthecum were also observed, but the variety could not be determined. Echinocereus engelmannii was also observed, but it was not the endangered variety purpureus. With the exception of Astragalus, Penstemon, and Eriogonum, most of these species and varieties are not likely to be the individuals Currently Listed or Currently Under Review. Many of the listed species or varieties are generally known only from specific habitats, not found in the Dry Lake area, or are known only from distant, out-of-state areas.

A rare species may also be overlooked if it flowers only briefly or at unusual times, if it germinates infrequently, or if it experiences long periods of dormancy. In addition, not all areas of the valley were studied, and some species may occur outside of the facilities sites. Selection of the sites for specific geologic and topographic characteristics may have

preselected for plant and wildlife species as well. For this reason, it is difficult to determine whether distribution, as evidenced from the study sites, is actually representative of the valley. Some areas, such as washes, were avoided in siting of facilities due to geological unsuitability. These areas may support species not found in the surveyed areas.

3.2.3 Overview of Wildlife

Wildlife species and signs were documented during the field survey. However, discontinuity of animal populations in both time and space has long been recognized as a natural phenomenon which often makes interpretation of survey results difficult (Elton, 1927). In arid and semiarid lands, events influencing population size and distribution are especially irregular in time and intensity (Low, 1979).

The abiotic desert environment has a strong influence on the developmental and reproductive processes of its animal inhabitants. Precipitation is the major factor controlling reproduction in desert habitats. Wildlife are strongly influenced by the annual precipitation rate, a factor which can fluctuate greatly from year to year (Riechert, 1979; Mayhew, 1966; and Beatley, 1969b). For example, studies have shown that the spadefoot toad, Scaphiopus bombifrons, will not breed unless at least .07 inch (2 mm) of rain has fallen (Woody and Thomas, 1968). A direct relationship has also been shown between the biomass of rodents in an area and the amount of rainfall (Harris, 1971).

Some animals depend on precipitation indirectly for food (Van DeGraaff and Balda, 1973; Turner and others, 1973; and Chew and Chew, 1970). In arid regions, plant productivity is greatest in the spring when temperature and moisture are not limiting factors. Thus, wildlife activity monitored at the time of the field study probably underestimates average annual wildlife in the valley.

Animal activity also varies with temperature and light, both of which are functions of time. Species observed in early morning may have disappeared by noon. Because of the natural variations, season of the survey, and other factors discussed above, the species list compiled (Table 3-8) probably does not include every species using the survey sites in Dry Lake Valley.

The following sections present an overview of the major animal species observed within the valley during the field survey. A cluster-by-cluster discussion is provided in Section 3.2.5.

3.2.3.1 Small Mammals

Rodent activity was minimal, which was likely due to the time of year (Beatley, 1969b; and Van DeGaaff and Balda, 1973). A list of small mammal species expected to occur in the valley is provided in Appendix C. Few direct sightings of rodents were recorded, since rodents are primarily nocturnal. However, a grasshopper mouse was sighted at Shelter Site 9/16 and a Townsend ground squirrel at Shelter Site 4/20. Limited trapping was conducted to inventory nocturnal rodents in two types of vegetation. A summary of the trapping results is given in Table 3-9.

Common Name	Scientific Name
MAMMALS	
Blacktailed jackrabbit	Lepus californicus
Desert cottontail rabbit	Sylvilagus audubonii
Antelope ground squirrel	Ammospermophilus leucurus
Townsend ground squirrel	Citellus townsendii
Pocket gopher	Thomomys sp.
Great Basin Kangaroo rat	Dipodomys microps
Southern grasshopper mouse	Onychomys torridus
Deer mouse[(a)]	Peromyscus maniculatus
Canyon mouse[(a)]	Peromyscus crinitus
Little pocket mouse[(a)]	Perognathus longimembris
Coyote	Canis latrans
Kit fox	Vulpes macrotis
Badger	Taxidia taxus
Bobcat	Lynx rufus
Mule deer	Odocoileus hemionus
Antelope (pronghorn)	Antilocapra americana
Bighorn sheep	Ovis canadensis
BIRDS	
Turkey vulture	Cathartes aura
Cooper's hawk	Accipiter cooperi
Red tailed hawk	Buteo jamaicansis
Ferruginous hawk	Buteo regalis
Rough legged hawk	Buteo lagopus

(a) Trapped near shelter sites

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SUMMARY OF WILDLIFE SPECIES AND SIGN OBSERVED IN DRY LAKE VALLEY, NEVADA SURVEY AREAS

PAGE 1 OF 2 TABLE 3-8

Common Name	Scientific Name
BIRDS (Continued)	
Northern harrier	Circus cyaneus
Golden eagle	Aquila chrysaetos
Prairie falcon	Falco mexicanus
American kestrel	Falco sparverius
Burrowing owl	Speotyto cunicularia
Horned lark	Eremophila alpestris
Raven	Corvus corax
Crow	Corvus brachyrhynchos
Cactus wren	Campylorhynchus brunneicapillus
Sage thrasher	Oreoscoptes montanus
Loggerhead shrike	Lanius ludovicianus
Western meadowlark	Sturnella neglecta
Vesper sparrow	Pooecetes gramineus
Sage sparrow	Amphispiza belli
Gambel's quail	Lophortyx gambelii
Seesee partridge	Ammoperdix griseogularis
REPTILES	
Zebra-tailed lizard	Callisaurus draconoides
Long-nosed leopard lizard	Crotaphytus wislizenii
Great Basin fence lizard	Sceloporus occidentalis
Sagebrush lizard	Sceloporus graciosus
Side-blotched lizard	Uta stansburiana
Desert horned lizard	Phrynosoma platyrhinos
Great Basin whiptail lizard	Cnemidophorus tigris tigris
Striped whipsnake	Masticophis taeniatus
Gopher snake	Pituophis melanoleucus
Great Basin rattlesnake	Crotalus viridis lutosus

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SUMMARY OF WILDLIFE SPECIES AND SIGN OBSERVED IN DRY LAKE VALLEY, NEVADA SURVEY AREAS

TABLE 3-8

Location and Date	Vegetation Type	Common Name	Scientific Name
1/4 mile east of Ely Spring Marker 10/19/80 - 10/21/80	Alkali sink scrub	Southern grass-hopper mouse	Onychomys torridus
		Dark kangaroo mouse	Microdipodops megacephalus
		Great Basin kanagaroo rat	Dipodomys microps
		Little pocket mouse	Perognathus longimembris
Panaca Road 10/30/80-11/1/80	Great Basin Sagebrush	Southern grass-hopper mouse	Onychomys torridus
		Great Basin kangaroo rat	Dipodomys microps
		Deer mouse	Peromyscus maniculatus
		Canyon mouse	Peromyscus crinitus

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SPECIES OBTAINED BY TRAPPING

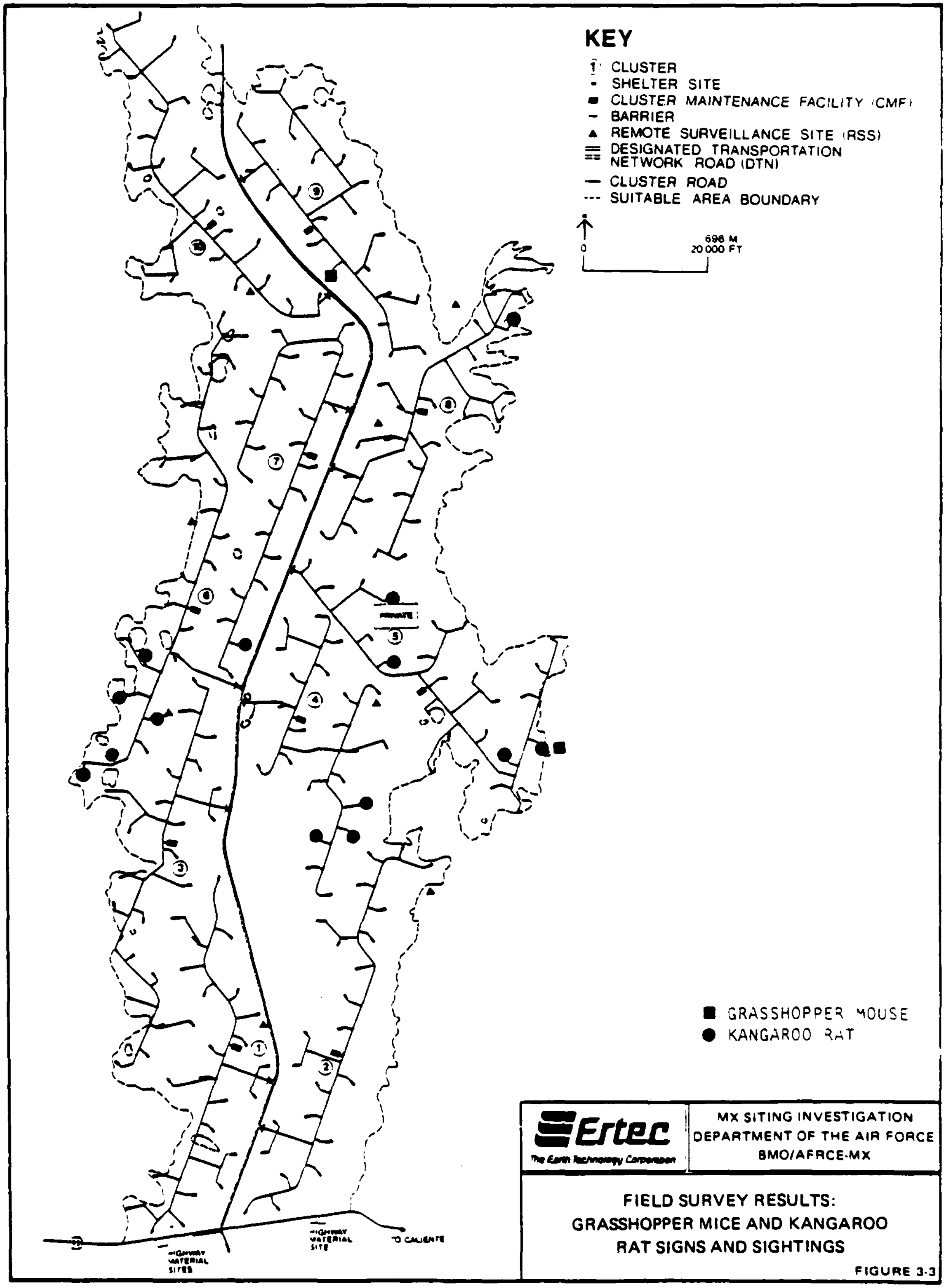
TABLE 3-9

The distribution of many wildlife species in Dry Lake Valley was determined from signs such as bones, tracks, or scat. Active and inactive mammal and bird burrows were present throughout the valley, and in many cases it was also possible to identify below-ground inhabitants by burrow design and construction.

The kangaroo rat constructs mounds of sand or fine soil which are a characteristic feature of desert areas (Murie, 1974). The mounds can be over 3 feet (1 m) high and greater than 12 feet (4 m) in diameter, with a number of entrances 4 to 5 inches (10 to 13 cm) in diameter. Kangaroo rat burrow systems or tracks characteristic of the kangaroo rat were noted at 14 sites in the valley. With only one exception, kangaroo rat activity appeared limited to the central portion of the valley.

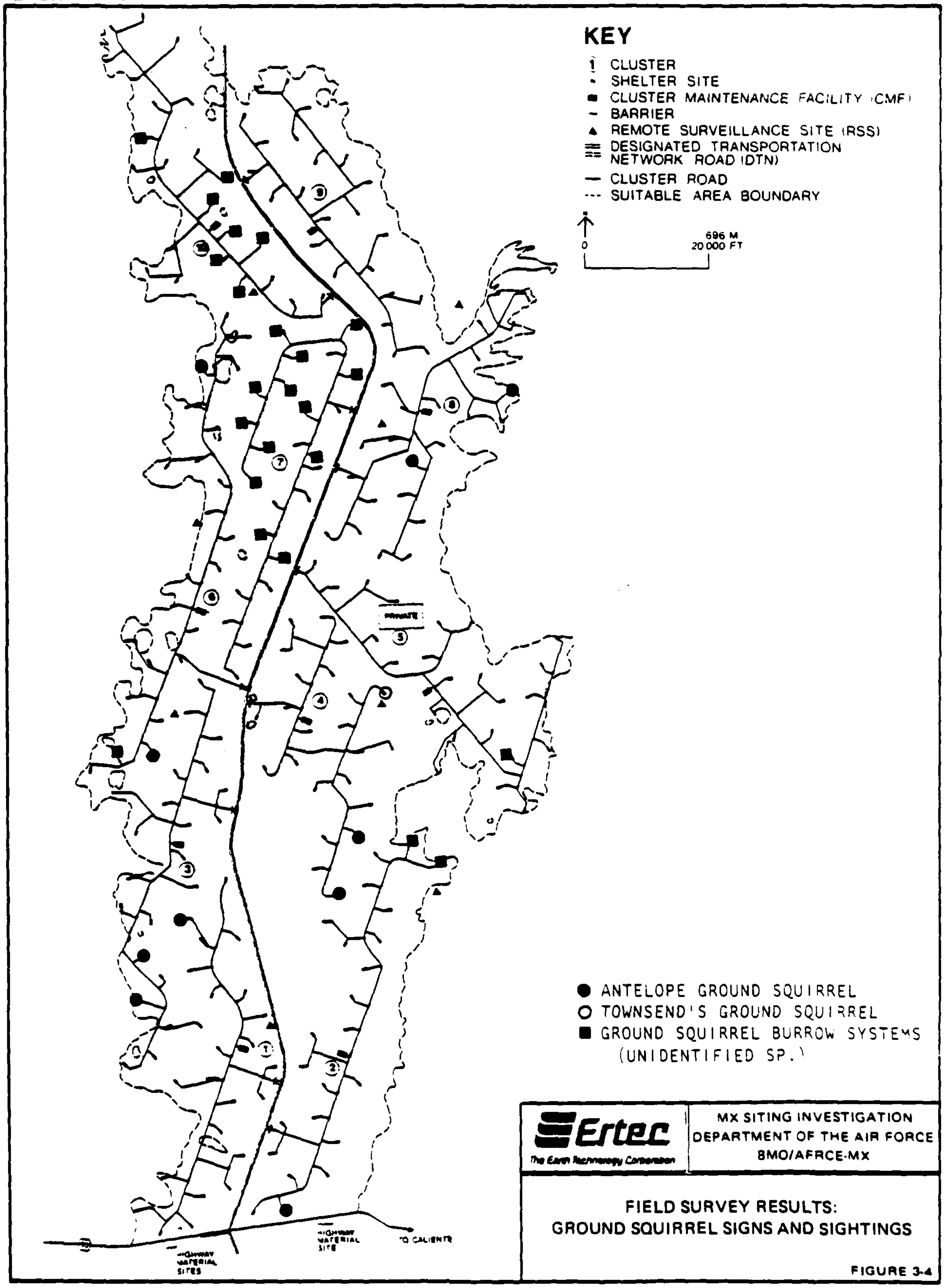
Antelope ground squirrels are colonial in nature (Robinson, 1980). Burrow systems are constructed under shrub clumps and may have many entrances. These networks were abundant in the valley. Antelope ground squirrels were identified at 10 shelter sites and Townsend ground squirrels at one site in the valley. An additional 24 sites contained ground squirrel burrow systems that could not be identified as to species.

Earth cores and/or mound plugs, a sign of gopher activity, were also recorded from several scattered sites. Infrequently, badger diggings and grasshopper mice were noted. Distribution of small mammal sightings and signs observed during the field survey is shown in Figures 3-3 through 3-5.



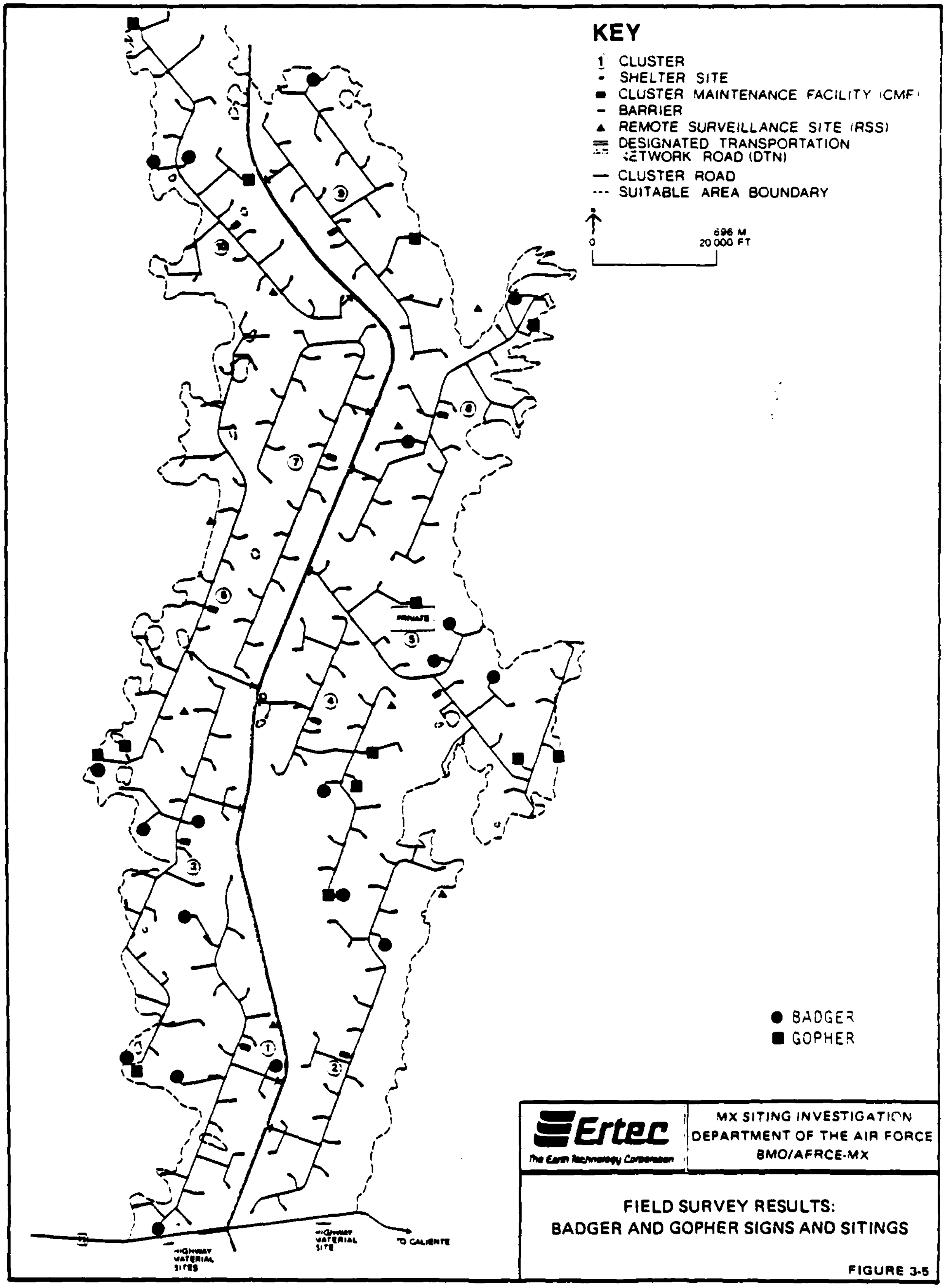
FIELD SURVEY RESULTS:
GRASSHOPPER MICE AND KANGAROO RAT SIGNS AND SIGHTINGS

FIGURE 3-3



FIELD SURVEY RESULTS:
GROUND SQUIRREL SIGNS AND SIGHTINGS

FIGURE 3-4



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FIELD SURVEY RESULTS:
BADGER AND GOPHER SIGNS AND SITINGS

FIGURE 3-5

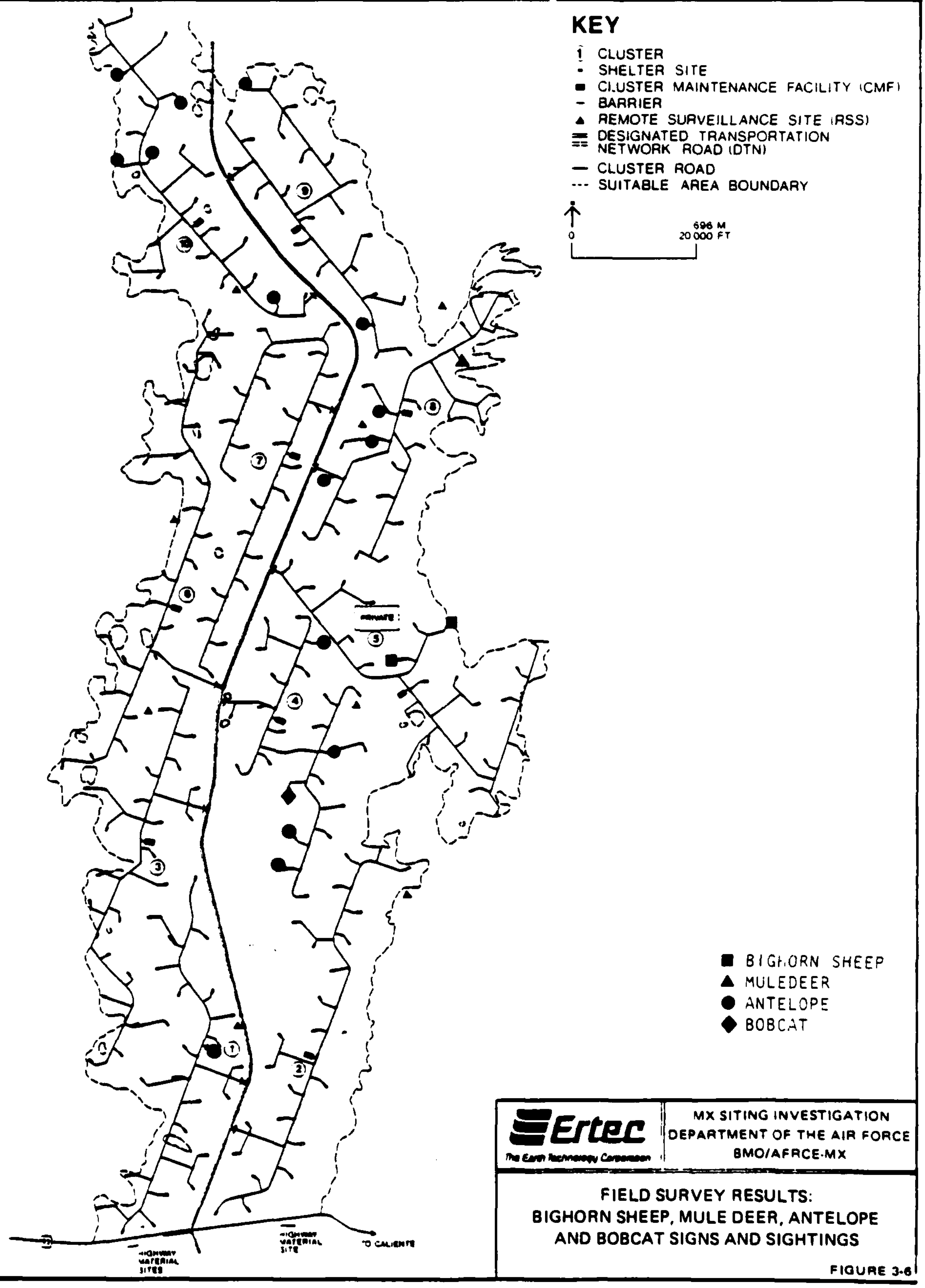
3.2.3.2 Large Mammals

Signs of bobcat, mule deer, and bighorn sheep in Dry Lake Valley were rare and randomly distributed. Distribution of the sign of these species observed during the field survey is shown in Figure 3-6. Bobcats are reported to have a widespread distribution in the vicinity (State of Nevada, 1973); however, scat and signs of scratching were observed on only one shelter site, near the middle of the valley.

The northeastern portion of Dry Lake Valley is considered key winter area for mule deer, and a possible east-west migration route is thought to exist in the northern end of the study area as shown in Figure 2-4. Evidence of mule deer activity (scat) was observed in only three locations on the northeastern edge of the valley within the key range area. This was not surprising since the survey was made in the fall. A survey during the winter would probably indicate much greater usage of the area.

The southwestern border of the valley is reported to have potential use by bighorn sheep as shown in Figure 2-3. No evidence of bighorn activity was observed in this area, but a bighorn sheep curl was found on Shelter Site 5/9, midway down the valley on the eastern side of the study area. Presence of the horn does not necessarily indicate recent usage of the area, since it may be old or have been transported from elsewhere.

Wild horses are protected under federal law (16 USC 1331 et. seq.). Wild horse and burro herds have been recorded in



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FIELD SURVEY RESULTS:
BIGHORN SHEEP, MULE DEER, ANTELOPE
AND BOBCAT SIGNS AND SIGHTINGS

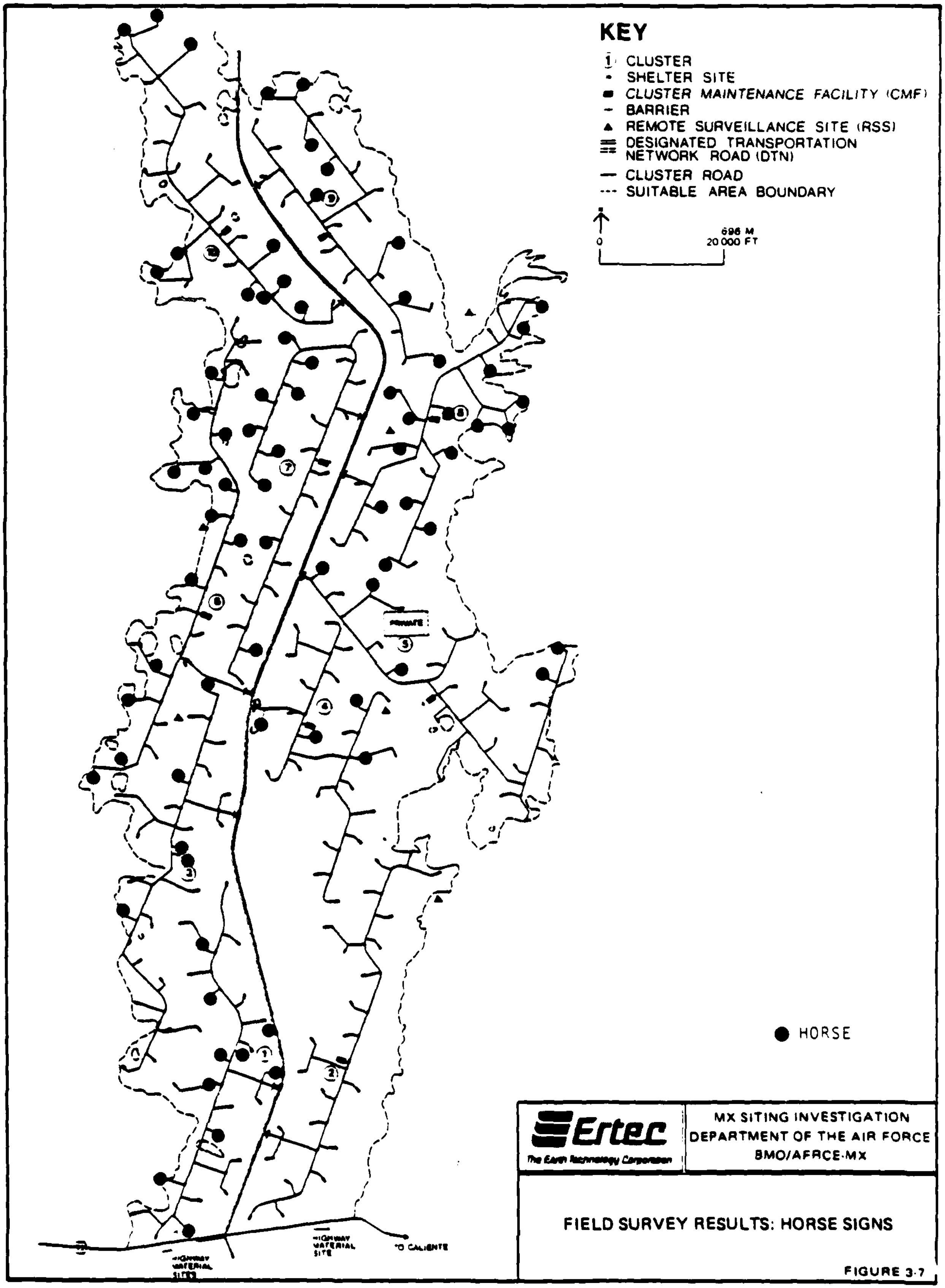
FIGURE 3-6

Dry Lake Valley, and observation of horse manure at 79 shelter sites during the field studies confirms a widespread horse distribution in the study area. Distribution of horse sign observed during the field study is shown in Figure 3-7. Although scattered throughout the valley, usage appears to be heaviest in the northern portion. Location of observed sign does not appear to correlate well with the expected distribution as shown in Figure 2-8. Some manure may be produced by domestic horses, but there was no way to distinguish between wild and domestic animals. This may account for the apparent lack of correlation.

Coyote activity was also widespread; signs were observed at 130 shelter sites within the valley (Figure 3-8). Evidence that coyotes have been killed to obtain pelts was observed in several locations in the valley. Coyote sign noted included scat, bones, fur, tracks, and howling.

Evidence of antelope and kit fox activity was also abundant in the valley. Both species are classified as protected by the Nevada Department of Wildlife (1980); antelope are protected as game animals and kit fox as furbearers.

Evidence of kit fox activity was observed at 28 shelter sites scattered throughout the valley, but only five of these contained active dens. Distribution of kit fox as observed in the study areas is shown in Figure 3-9. Grey fox are known from areas adjacent to the valley, but no evidence of grey fox was observed in the study area.



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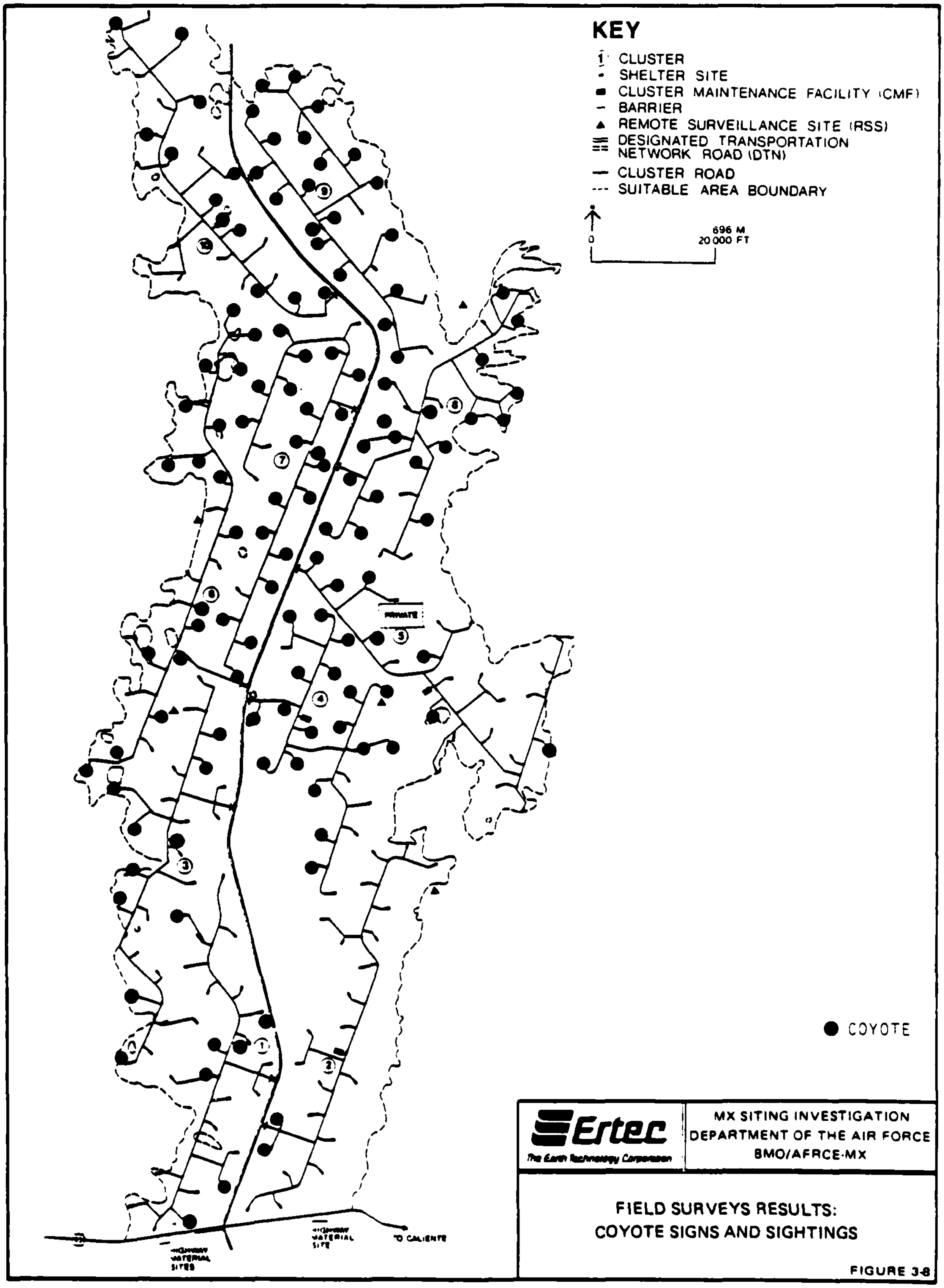
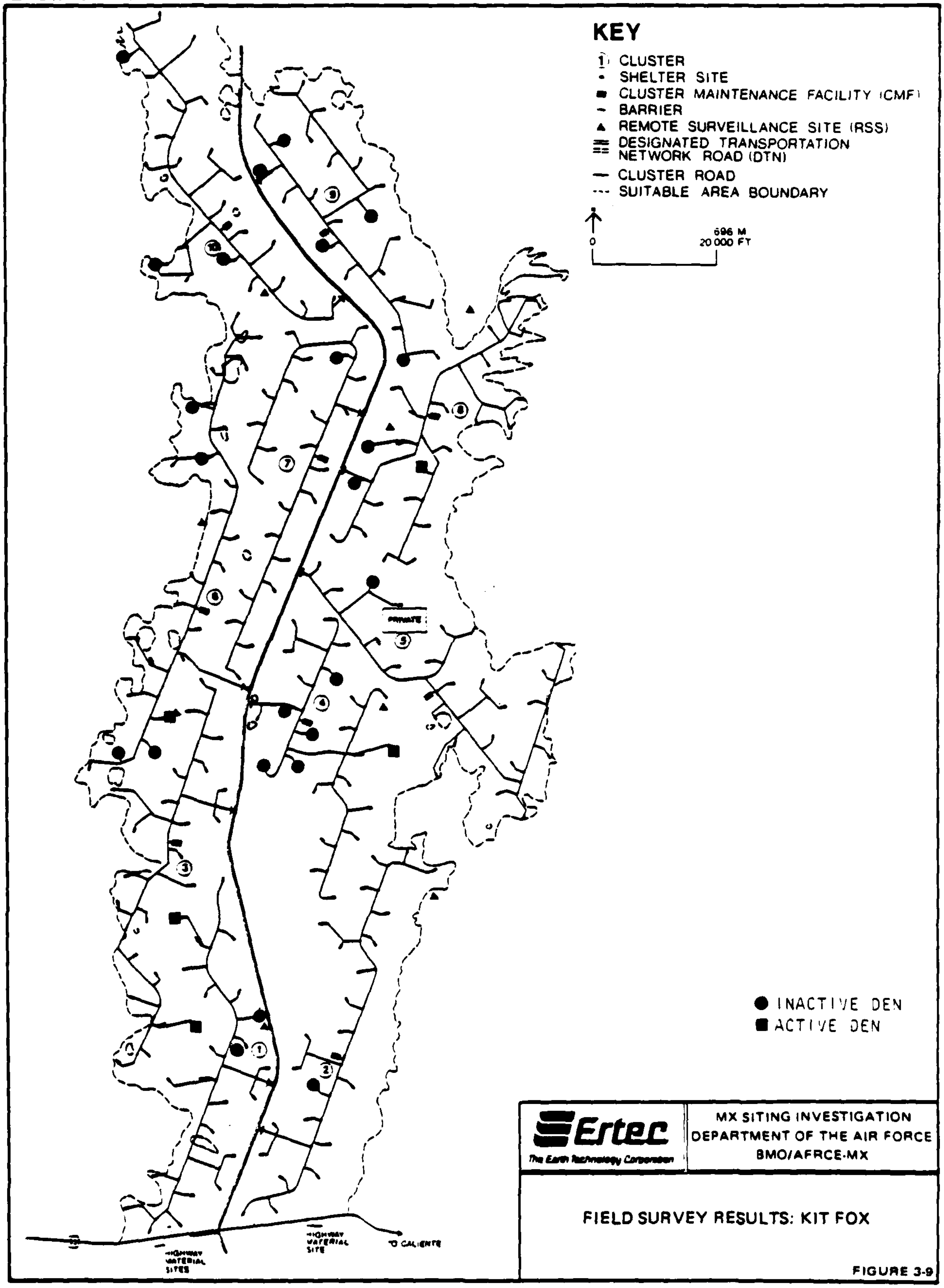
FIELD SURVEY RESULTS: HORSE SIGNS

FIGURE 3-7



FIELD SURVEYS RESULTS:
COYOTE SIGNS AND SIGHTINGS

FIGURE 3-8



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FIELD SURVEY RESULTS: KIT FOX

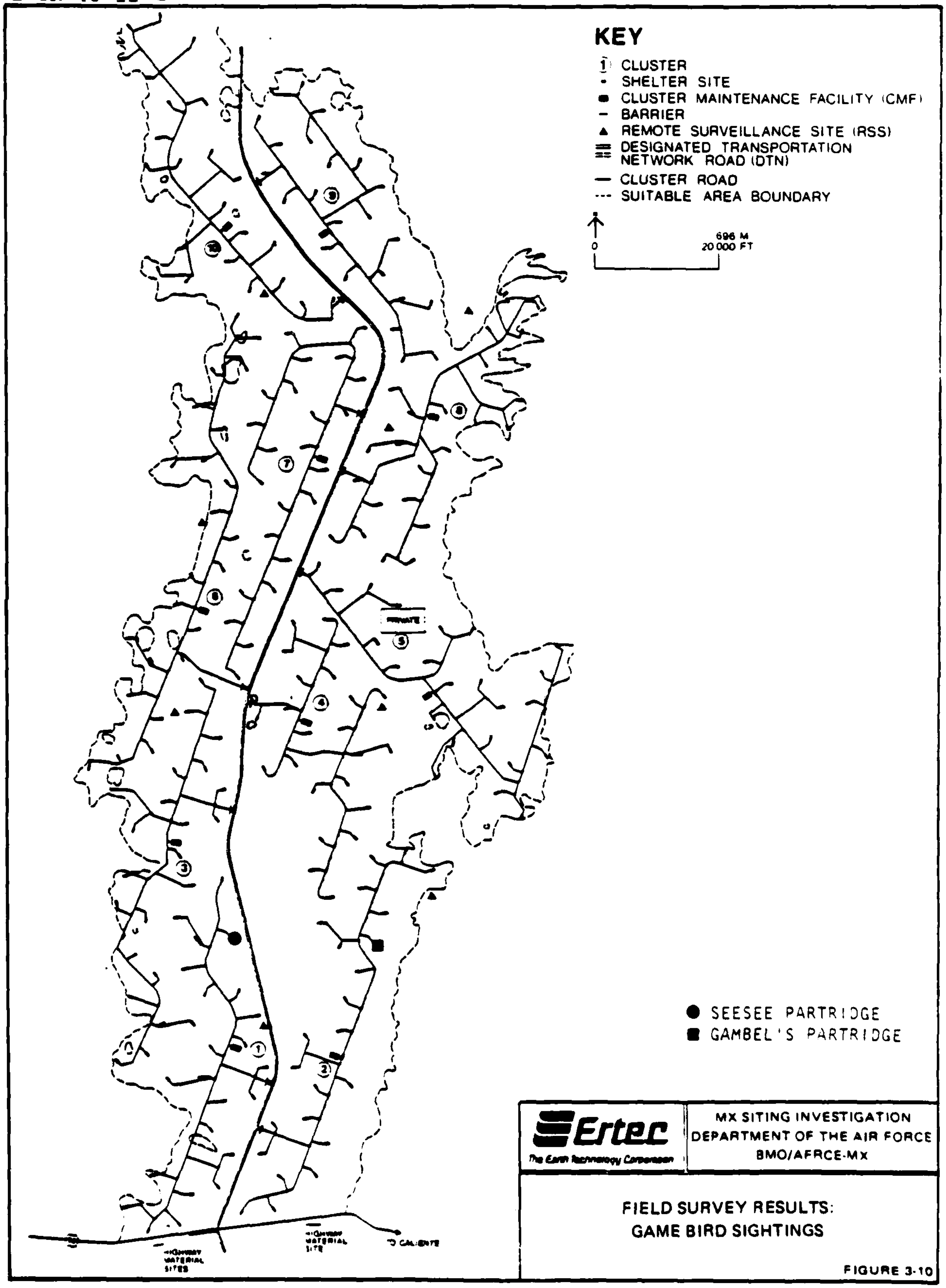
FIGURE 3-9

The majority of Dry Lake Valley is potential antelope habitat as shown in Figure 2-2. Antelope activity was determined primarily by presence of scat rather than actual sightings. The field investigations revealed antelope activity in 15 shelter sites, located in a somewhat linear pattern, from the northern to the southern end of the valley. Figure 3-6 illustrates areas where antelope sign were observed. The presence of a migration route through the valley has been postulated by the Nevada Department of Wildlife (1980), although signs of antelope activity were too few to substantiate this.

3.2.3.3 Birds

Quail have been reported in Dry Lake Valley (State of Nevada, 1973). Their distribution in southern Nevada is discussed in Section 2.3. Only one Gambels quail was observed during the field study. It was seen on Shelter Site 2/18 in the southeastern portion of the study area.

An exotic game bird, the Seesee partridge, was introduced by the Nevada Department of Fish and Game with hopes that it would adapt to various habitats in Nevada (State of Nevada, 1973). This partridge can tolerate river bottoms and canyon areas in the normal chukar partridge range but can also extend its range to areas too dry for the chukar. The transplant was not considered successful, but one bird was sighted in the southern portion of the valley at Shelter Site 1/21. Game bird sightings are shown in Figure 3-10.



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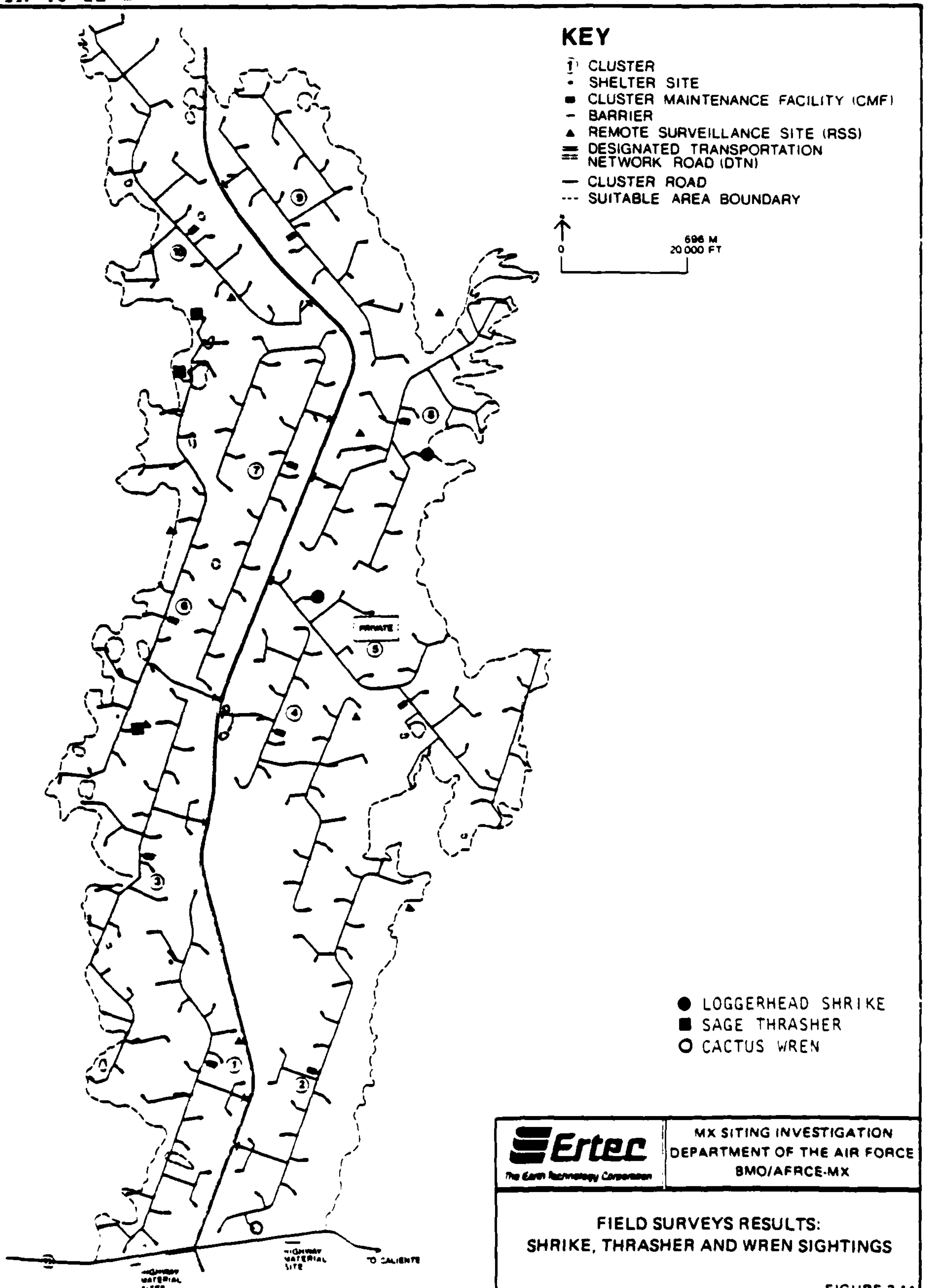
FIELD SURVEY RESULTS:
GAME BIRD SIGHTINGS

FIGURE 3-10

Nongame birds are protected by state law and by federal law under the Migratory Bird Treaty (16 USC 703). Species present in Dry Lake Valley include horned larks, sage sparrows, meadowlarks, vesper sparrows, loggerhead shrikes, sage thrashers, ravens, cactus wren, and crows. Because the horned lark is ubiquitous in the valley, the sighting distribution was not mapped. Distributions of other nongame species are shown in Figures 3-11 through 3-13.

A number of raptors, also protected by state and federal law, were observed during the field work. These included a golden eagle, prairie falcon, turkey vulture, American kestrel, burrowing owl, and five species of hawks. The species and vegetation types in which they were observed are listed in Table 3-10. The occurrence of these species in the valley floor depends on the availability of prey (Udvardy, 1977; and Snyder and Snyder, 1975). Sightings tended to occur toward the edges of the study area. This is expected, since most raptors nest in areas surrounding the valley rather than on the valley floor.

The golden eagle was observed in greater numbers than any other raptor. This was probably because its large size made it more visible and more readily identifiable by the field crew. It is likely that a number of other species are present that were not observed. Compilation of plant species lists and observation of animal signs tended to focus attention of the field crew on the immediate vicinity rather than on adjacent areas where birds might be present. In addition, many species



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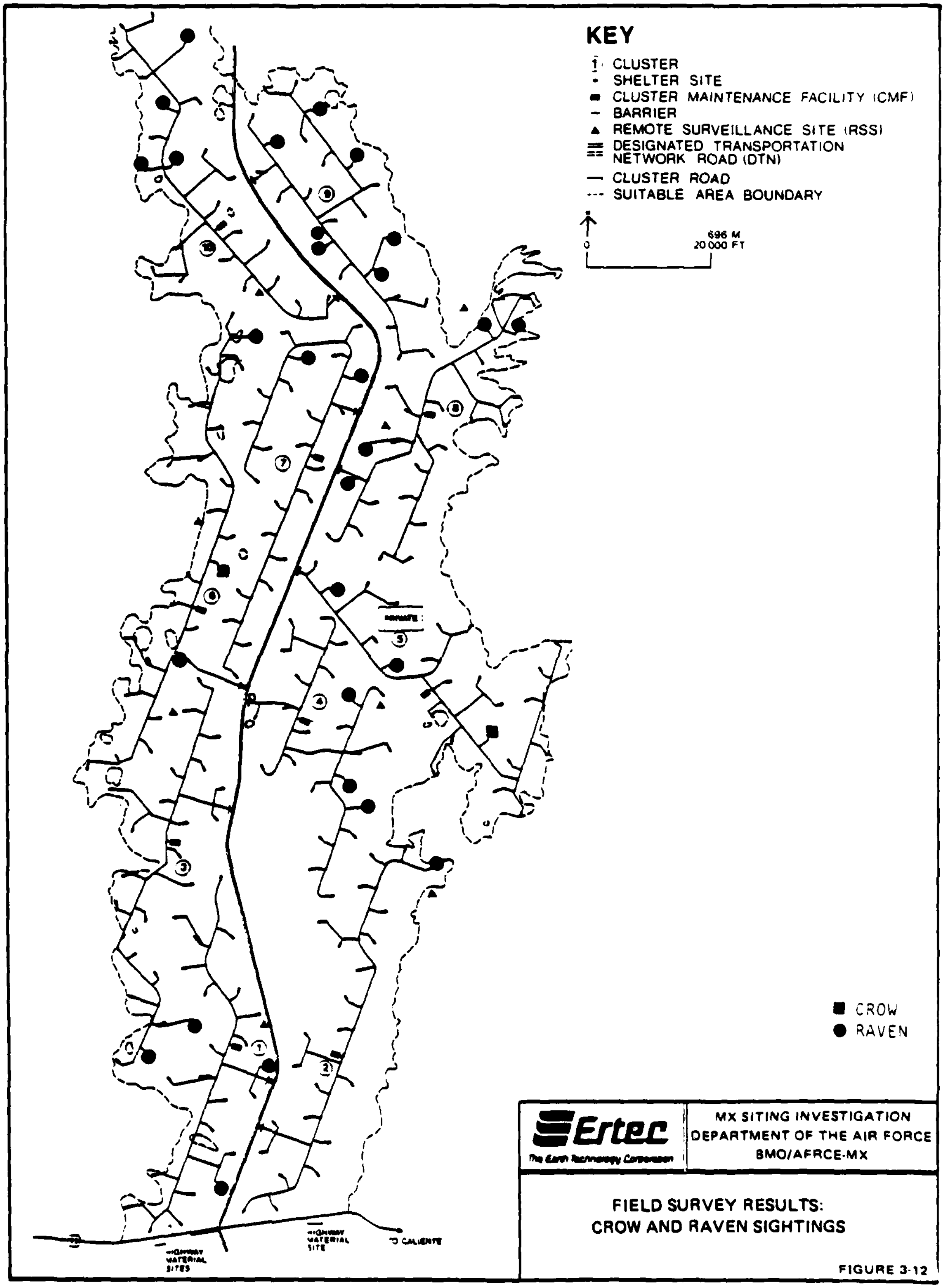
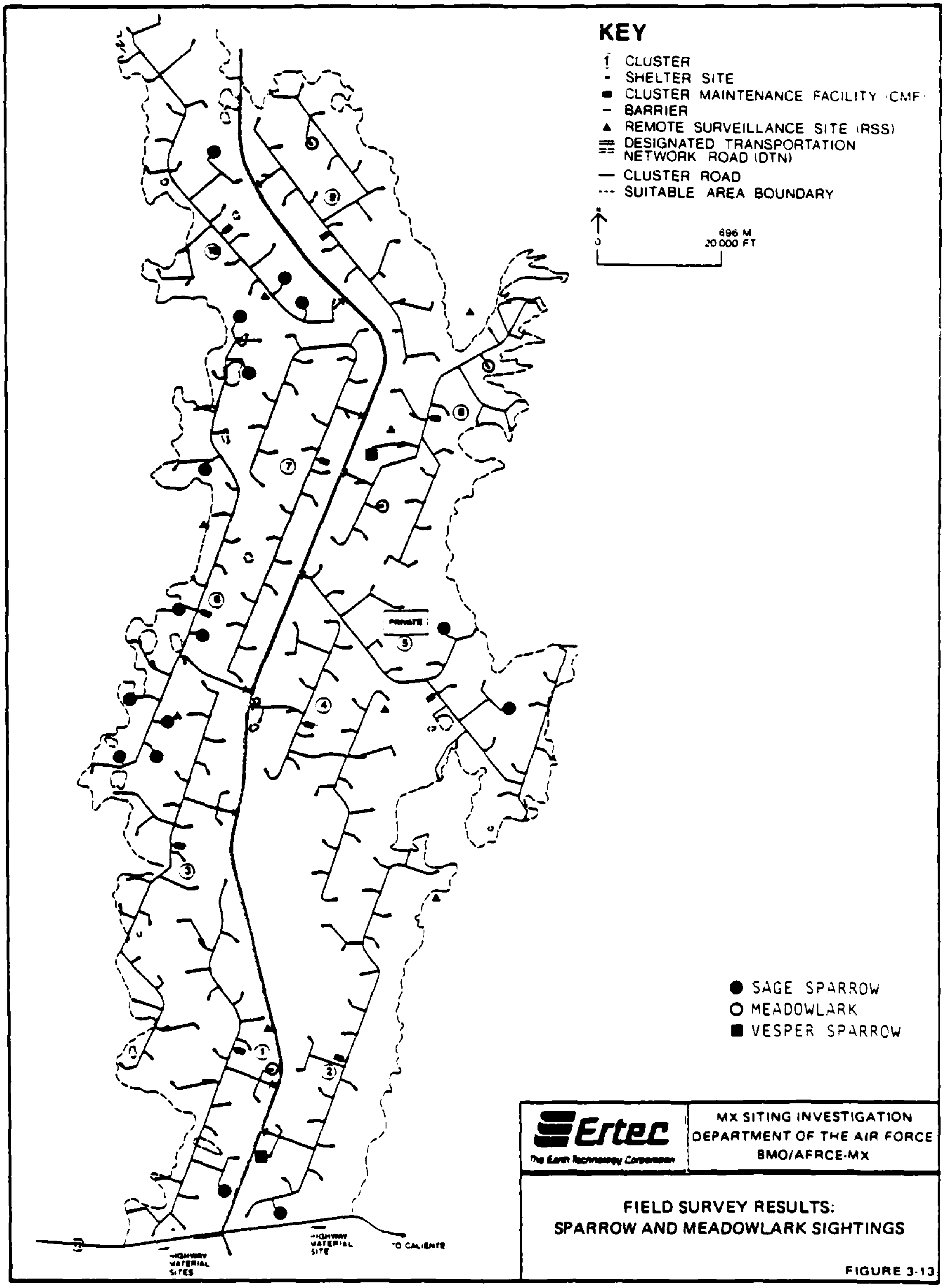
FIELD SURVEYS RESULTS:
SHRIKE, THRASHER AND WREN SIGHTINGS

FIGURE 3-11



FIELD SURVEY RESULTS:
CROW AND RAVEN SIGHTINGS

FIGURE 3-12



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FIELD SURVEY RESULTS:
SPARROW AND MEADOWLARK SIGHTINGS

FIGURE 3-13

Species	Scientific Name	Vegetation Type
Prairie falcon	Falco mexicanus	Artemisia tridentata and mixed shrubs
Northern harrier	Circus cyaneus	Mixed shrub, Ceratoides lanata/Chrysothamnus greenei; Ceratoides lanata/Chrysothamnus viscidiflorus
Golden eagle	Aquila chrysaetos	Mixed shrub; Ceratoides lanata/Chrysothamnus greenei; Ceratoides lanata/Chrysothamnus viscidiflorus
American Kestrel	Falco sparverius	Mixed shrub
Red-tailed hawk	Buteo jamaicansis	Mixed shrub; cheatgrass/dead trees; Grayia spinoza/Yucca brevifolia
Ferruginous hawk	Buteo regalis	Mixed shrub
Rough-legged hawk	Buteo lagopus	Chrysothamnus viscidifloris; Chrysothamnus viscidifloris/Ceratoides lanata
Cooper's hawk	Accipiter cooperii	Artemisia tridentata
Burrowing owl	Speotyto cunicularia	Atriplex confertifolia/Atriplex canescens; Kochia americana
Turkey vulture	Cathartes aura	Artemisia tridentata/Chrysothamnus greenei

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RAPTORS OBSERVED DURING FIELD SURVEYS: SEPTEMBER TO DECEMBER, 1980

TABLE 3-10

are seasonal residents. Other birds were observed from too great a distance to be positively identified.

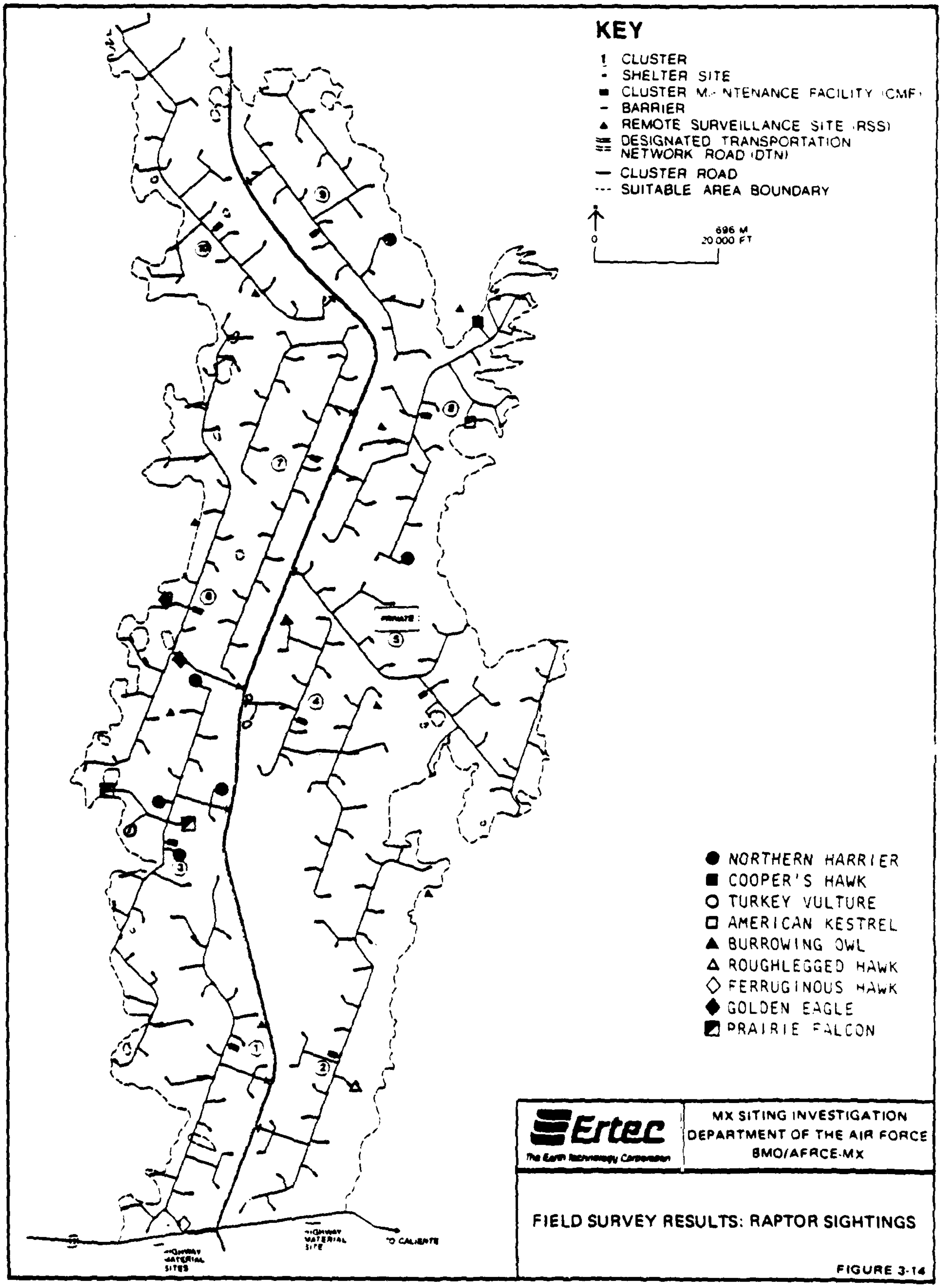
A bald eagle (Haliaeetus leucocephalus) and a swainson's hawk (Buteo swainsoni) have been previously observed in Dry Lake Valley (BLM, 1980); however, neither species was observed during the field investigations. Distribution of raptors observed during the survey are shown in Figure 3-14.

3.2.3.4 Reptiles

Reptiles identified in the study area include the side-blotched lizard, Great Basin fence lizard, sagebrush lizard, desert horned lizard, Great Basin whiptail, long-nosed leopard lizard, Great Basin gopher snake, and the Great Basin rattlesnake. All of the reptiles sighted have distributions that primarily encompass the Great Basin region (Stebbins, 1966).

The northern sagebrush lizard appeared to be concentrated in areas of alkali sink and shadscale scrub at the lower elevations in the middle of the study area. The long-nosed leopard lizard was frequently present in the southern end of Dry Lake Valley, but it was not sighted in the northern end. The Great Basin fence lizard was observed less frequently, but it occurred more often toward the northern end of the study area. The distribution of lizards is shown in Figures 3-15 through 3-17. Because the side-blotched lizard was ubiquitous thougnout the study area, its distribution was not mapped.

The Great Basin rattlesnake, striped whipsnake, and the Great Basin gopher snake were the only two species of snakes seen in



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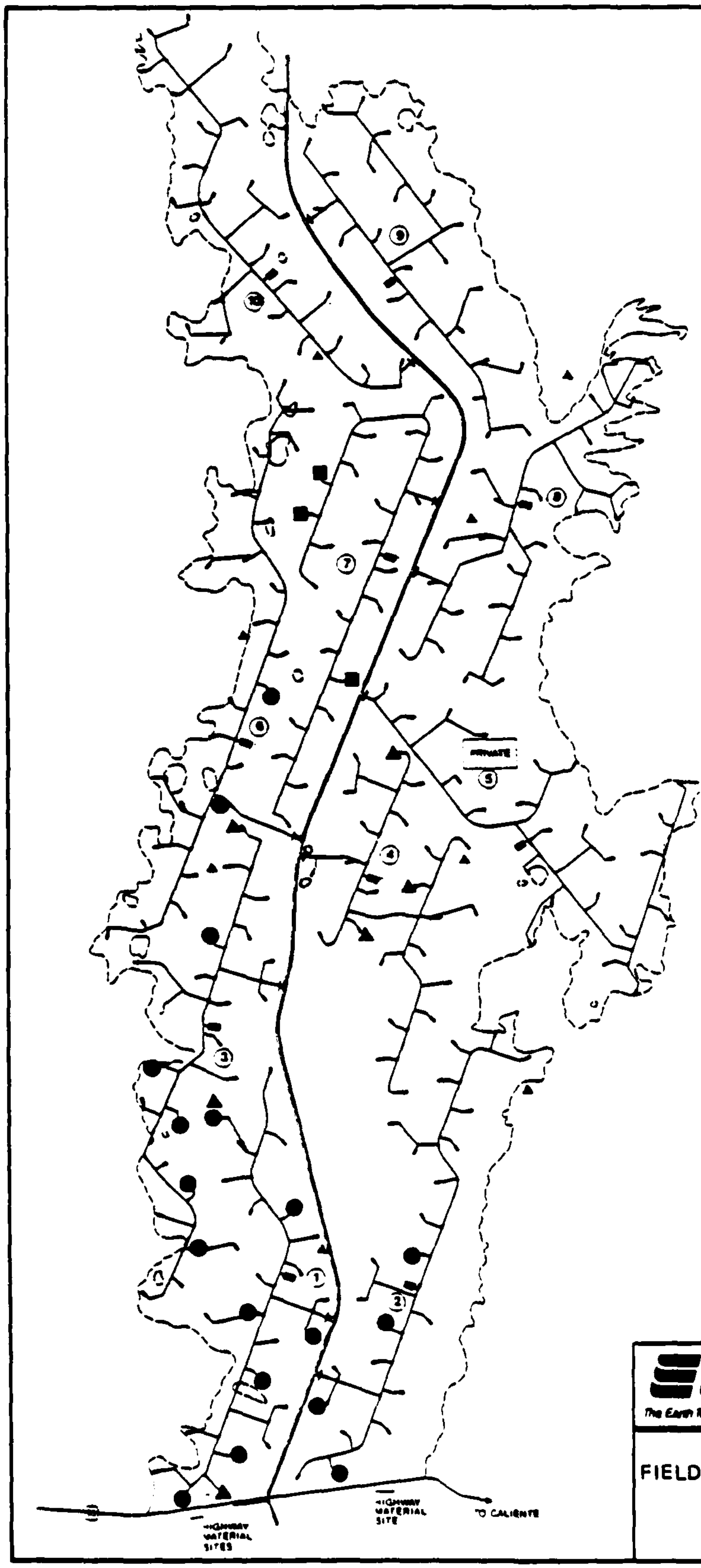
FIELD SURVEY RESULTS: RAPTOR SIGHTINGS

FIGURE 3-14



KEY

- CLUSTER
- SHELTER SITE
- CLUSTER MAINTENANCE FACILITY (CMF)
- BARRIER
- REMOTE SURVEILLANCE SITE (RSS)
- DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)
- CLUSTER ROAD
- SUITABLE AREA BOUNDARY

0 — 696 M / 20 000 FT

- ■ GREAT BASIN FENCE LIZARD
- ● LONG NOSED LEOPARD LIZARD
- ▲ GREAT BASIN WHIPTAIL LIZARD

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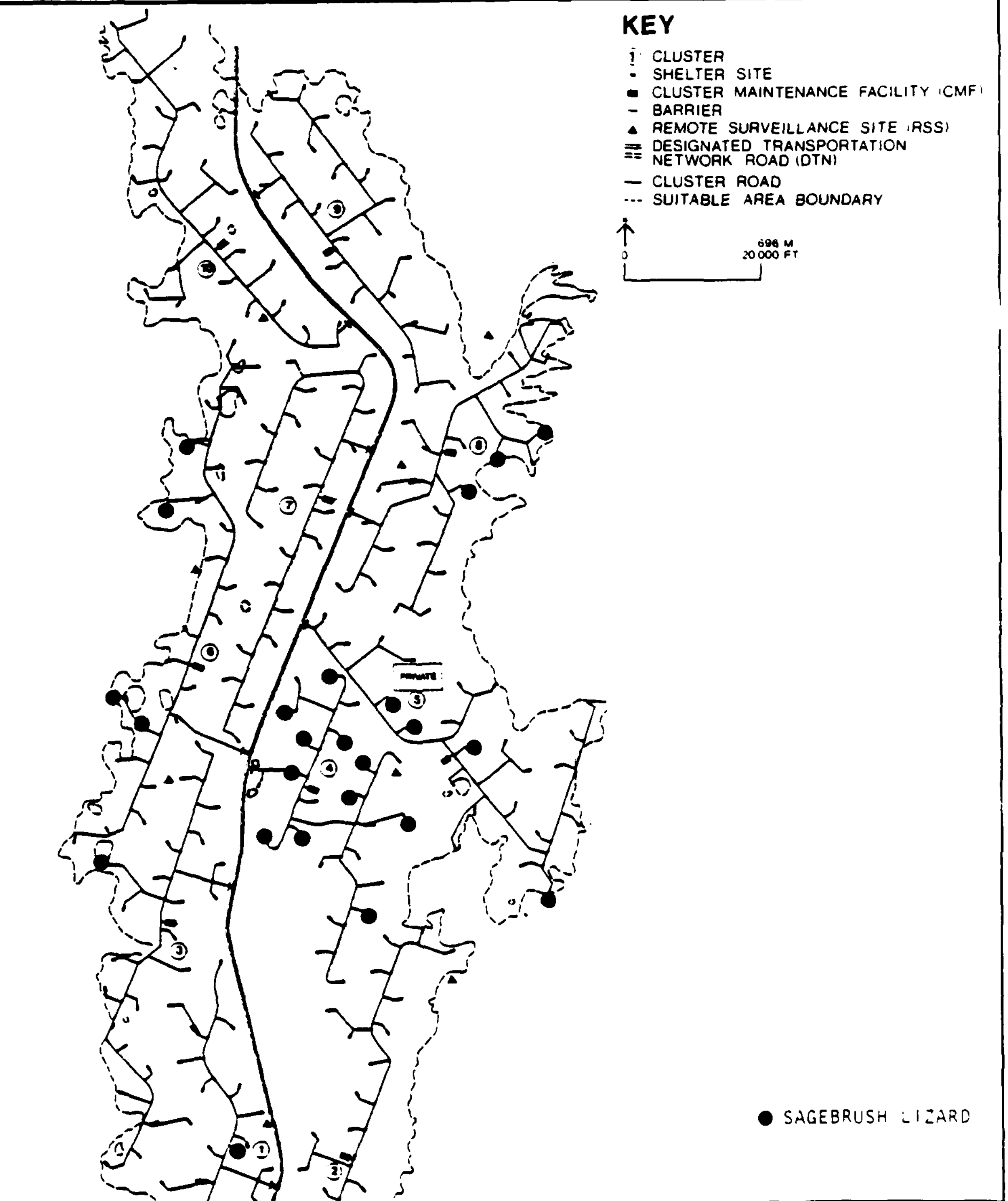
FIELD SURVEY RESULTS: FENCE, LEOPARD AND WHIPTAIL LIZARD SIGHTINGS

FIGURE 3-15



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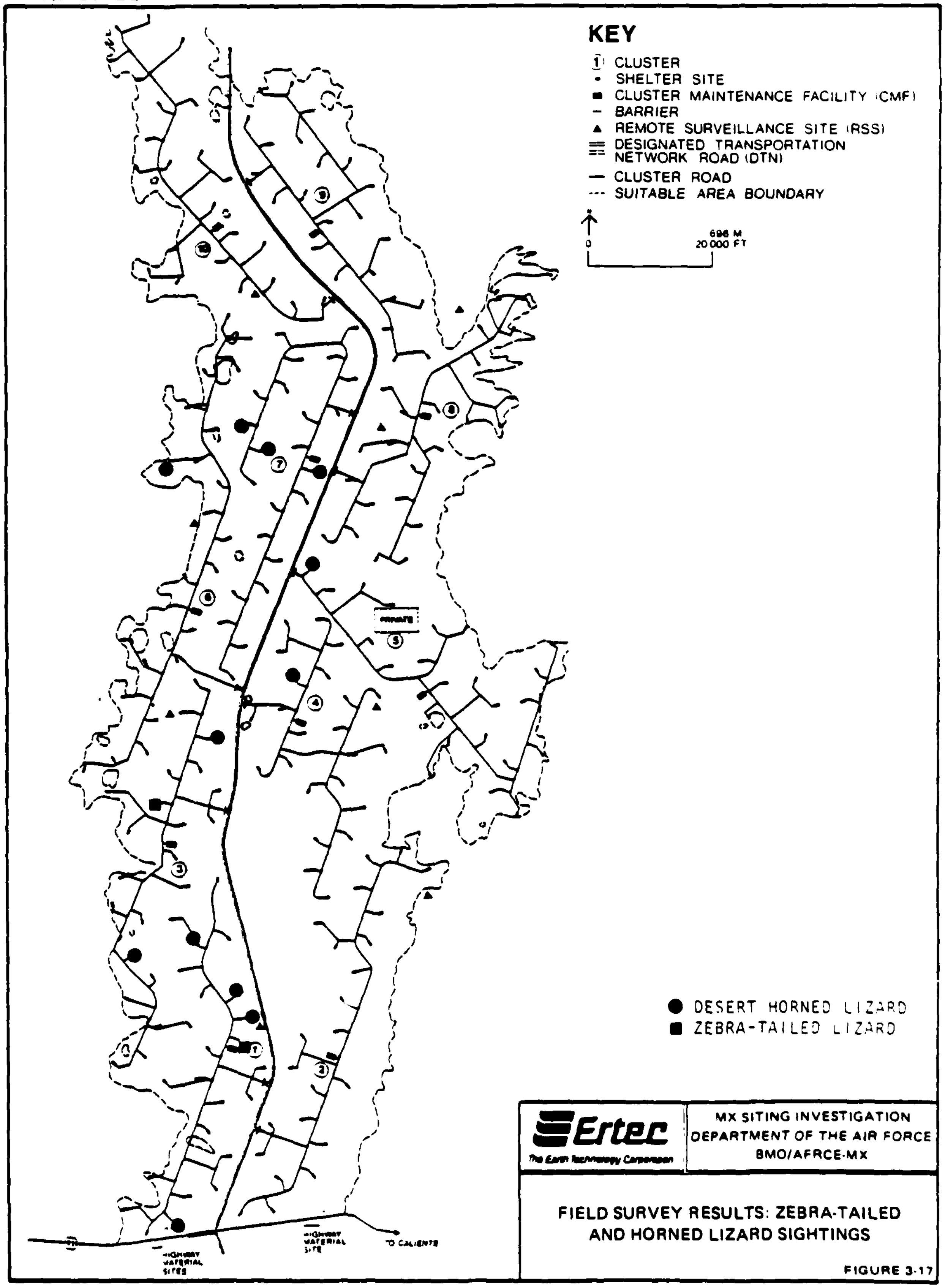
FIELD SURVEY RESULTS:
SAGEBRUSH LIZARD SIGHTINGS

FIGURE 3-16



FIELD SURVEY RESULTS: ZEBRA-TAILED AND HORNED LIZARD SIGHTINGS

FIGURE 3-17

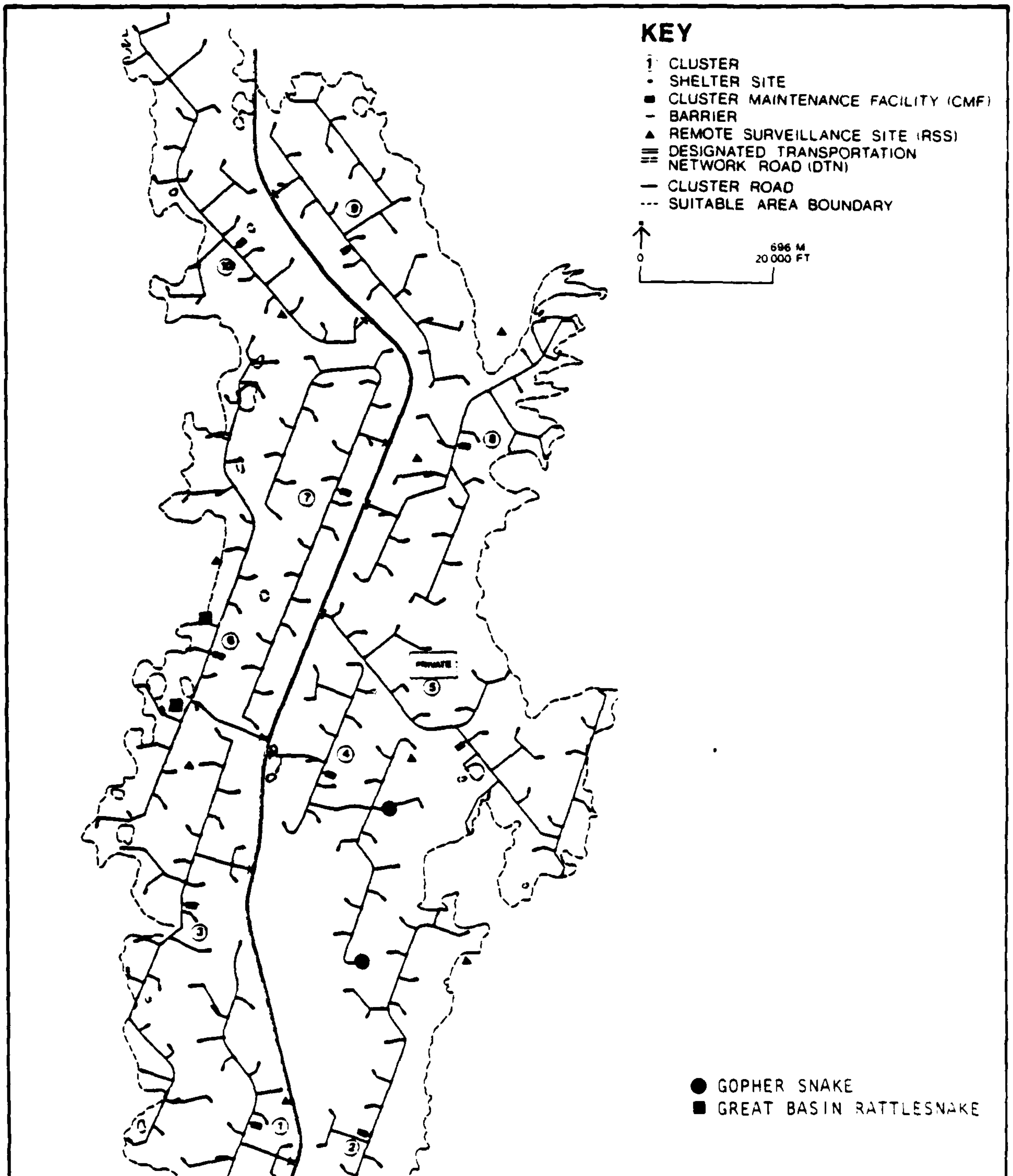
the survey areas. No snake activity was noted at the northern, cooler end of the study area, but sightings were too infrequent to draw any conclusions regarding distribution. Distribution of sightings is shown in Figure 3-18.

The distribution of the desert tortoise, a rare and protected species, is reported to extend northward to the southern end of Dry Lake Valley as shown in Figure 3-19. No evidence of the tortoise was noted during the field survey.

3.2.4 Overview of Disturbance Factors

A large amount of man-induced disturbance is present in the valley. Disturbance observed during the field survey was both direct and indirect, or secondary, disturbance. Direct disturbance results from grazing, off-road driving, and mining or construction activities. The invasion of the disturbed area by undesirable weeds such as Halogeton glomeratus and Salsola iberica is a secondary, or indirect, effect. These plants invade areas where soil has been disturbed or native plant cover has been degraded; thus, they provide a measure of the state of the natural ecosystem within the valley. In areas where grazing occurs, they also present problems for stock.

Halogeton has gained a large foothold, especially in the southern and central portions of the valley. Halogeton is toxic, and a number of sheep deaths have been reported due to its consumption. Cattle apparently consume it only in small amounts. While sublethal effects may occur, no cattle deaths have been attributed to it (HDR, 1980).



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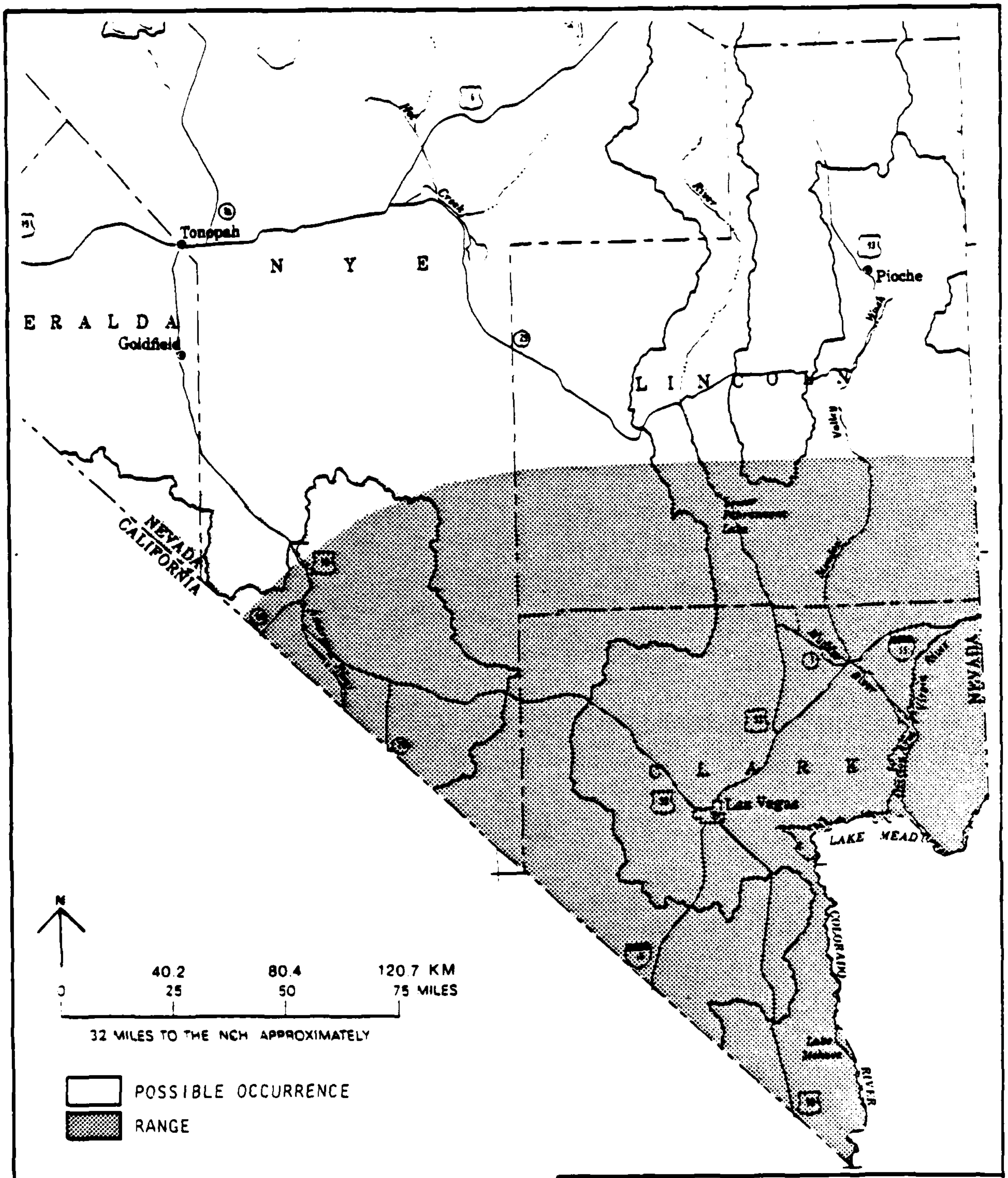
FIELD SURVEY RESULTS: SNAKE SIGHTINGS

FIGURE 3-18



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DESERT TORTOISE RANGE
IN SOUTHERN NEVADA

SOURCE: NEVADA DEPT. OF WILDLIFE, 1980

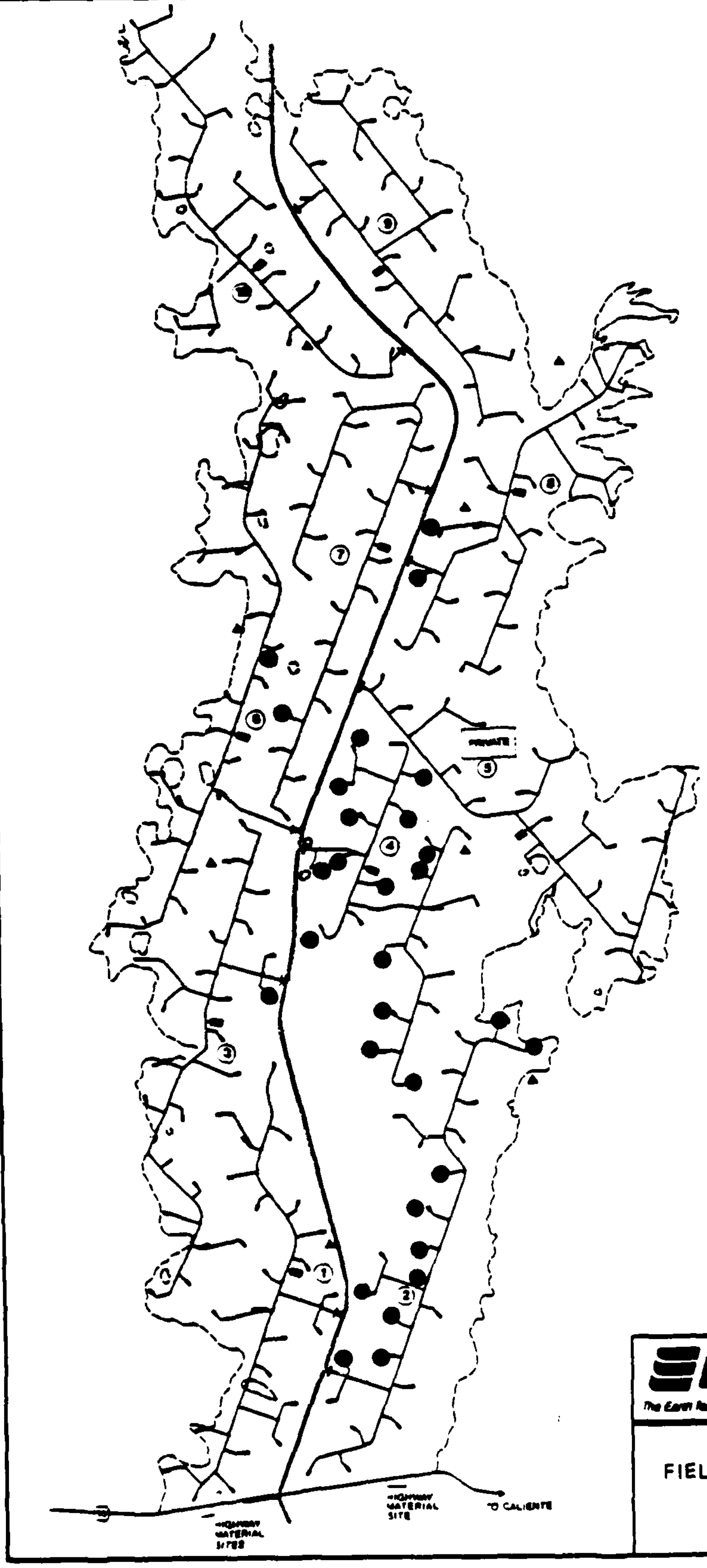
FIGURE 3-19

Overgrazing contributes to the spread of Halogeton, which, in turn, decreases the value of the area for grazing. This is discussed further in Section 4.0.

Salsola, another introduced weed, is sometimes cut and cured as a very poor substitute for hay. When eaten in considerable quantity in the green condition, it tends to cause severe scour in weak or young animals (Hitchcock, 1964). Salsola was observed on numerous shelter sites. It was more widely distributed in the eastern half of the study area. Distribution of Halogeton, Salsola, and areas impacted by grazing are shown in Figures 3-20 through 3-22. Areas impacted by Halogeton and Salsola seem to be somewhat negatively correlated with areas impacted by grazing. It is not clear whether this is due to the fact that ranchers attempt to avoid the Halogeton, or due to the fact that Halogeton has invaded areas previously grazed.

Off-road driving also disturbs soils and vegetation, allowing colonization by undesirable plants. Off-road driving was one of the primary disturbance factors noted throughout the study area.

A great deal of the off-road vehicle disturbance recorded was probably caused by the surveyors who placed shelter monuments. In many cases, it was not possible to determine whether the damage was caused by the surveyors or whether it existed prior to the survey. Due to the likelihood of survey-related damage, the disturbance observed in the study areas is probably greater than would be expected in other locations in the valley.



KEY

- CLUSTER
- SHELTER SITE
- CLUSTER MAINTENANCE FACILITY (CMF)
- BARRIER
- REMOTE SURVEILLANCE SITE (RSS)
- DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)
- CLUSTER ROAD
- SUITABLE AREA BOUNDARY

0 — 696 M — 20 000 FT

● HALOGETON GLOMERATUS

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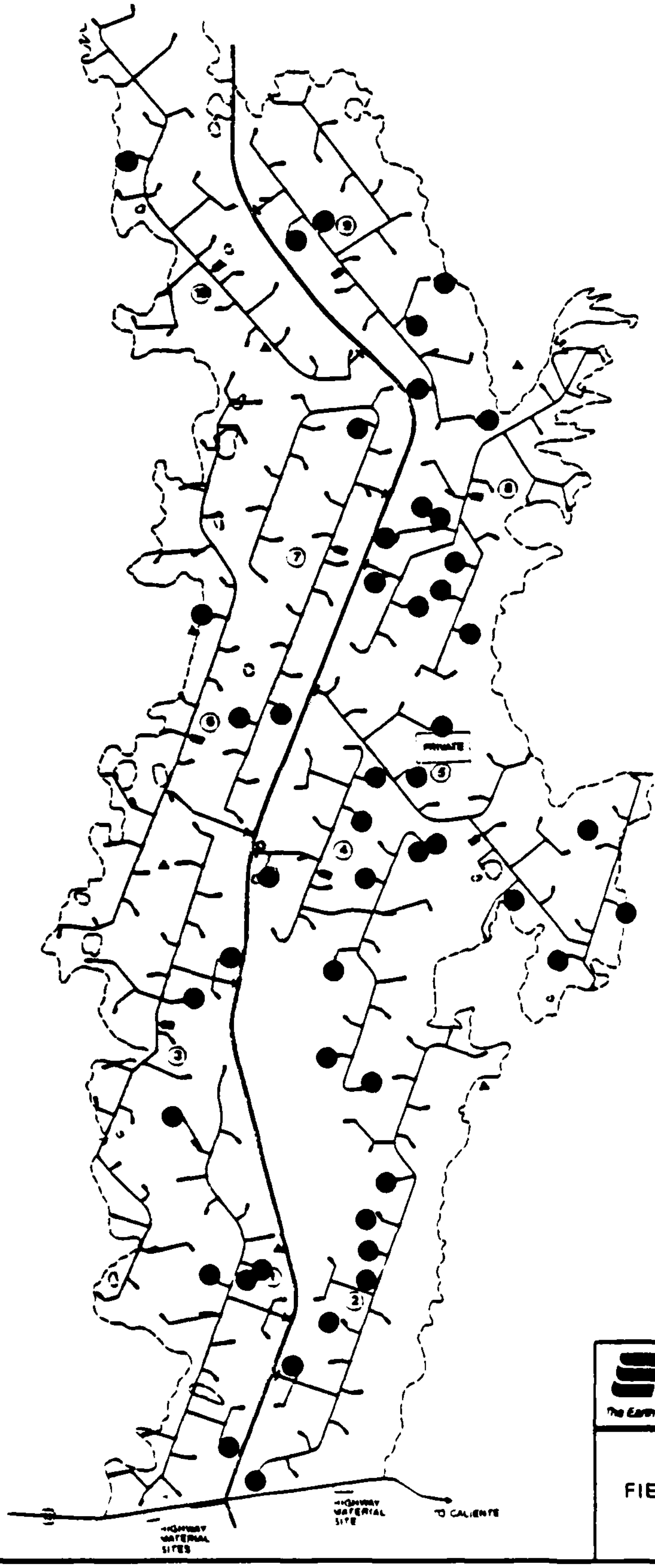
FIELD SURVEY RESULTS: DISTRIBUTION OF HALOGETON GLOMERATUS

FIGURE 3-20



KEY

- CLUSTER
- SHELTER SITE
- CLUSTER MAINTENANCE FACILITY (CMF)
- BARRIER
- REMOTE SURVEILLANCE SITE (RSS)
- DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)
- CLUSTER ROAD
- SUITABLE AREA BOUNDARY

0 696 M
20 000 FT

● SALSOLA IBERICA

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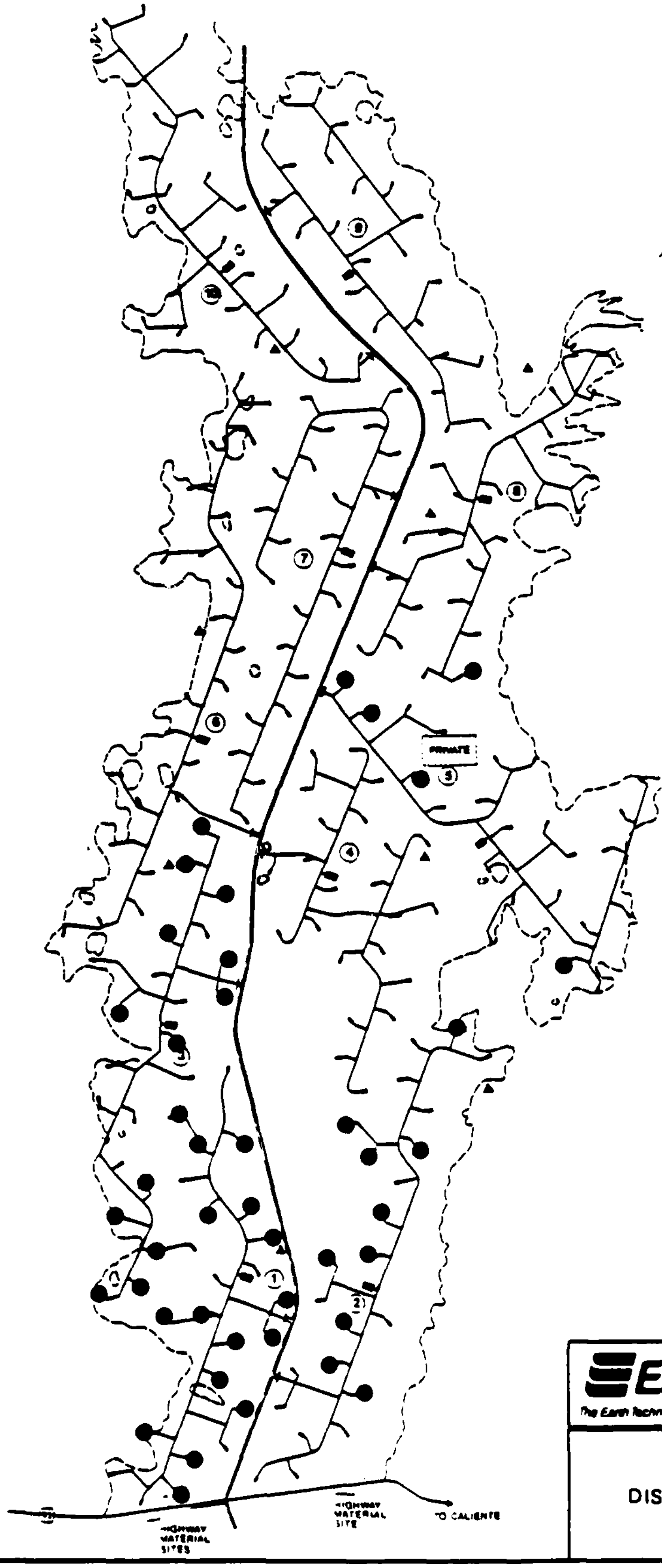
FIELD SURVEY RESULTS: SALSOLA IBERICA

FIGURE 3-21



KEY

- 1 CLUSTER
- SHELTER SITE
- CLUSTER MAINTENANCE FACILITY (CMF)
- BARRIER
- REMOTE SURVEILLANCE SITE (RSS)
- DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)
- CLUSTER ROAD
- SUITABLE AREA BOUNDARY

0 — 696 M / 20 000 FT

● DOMESTIC COW SIGN AND SIGHTINGS

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FIELD SURVEY RESULTS: DISTURBANCE RELATED TO GRAZING

FIGURE 3-22

3.2.5 Results of Cluster Surveys

3.2.5.1 Summary of Conditions in Cluster 1

a. Abiotic Conditions: The legal descriptions of Cluster 1 sites are given in Appendix F. Elevations range from 4230 to 4985 feet (1302 to 1534 m), and all sites are located on slopes of approximately 3 degrees. The soil is alluvial and dominated by silt intermixed with gravel and sand. Abiotic factors within the cluster are summarized in Table 3-11.

b. Disturbance: Low to moderate disturbance was observed on all shelter sites in Cluster 1, except for Shelter Sites 4, 6, and 9, which were highly disturbed. Off-road vehicle damage, the primary cause of disturbance, was noted on 18 survey sites, but grazing has also had a significant impact, and signs were evident on 16 of the 23 shelter sites. Salsola iberica, a species that invades disturbed areas, is present on five shelter sites. Halogeton glomeratus, also an invader in disturbed areas, was not noted in Cluster 1.

c. Threatened or Endangered Plant Species: One individual of Coryphantha vivipara was identified from Shelter Site 3. This species is listed as a Taxon Currently Under Review in the 1980 Federal Register. It is a Category 2 plant, which means it is probably appropriate to list it as threatened or endangered, but sufficient information is not presently available to biologically support a ruling, and further research is necessary to determine its status. Other possible threatened or endangered plants observed include Cryptantha, Opuntia, Astragalus, and

Factor	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSSI	Resiting 3(c)
Elevation (feet)	4900	4985	4845	4840	4963	4760	4724	4230	4907	4715	4790	4657	4740	4630	4650	4610	4630	4715	4775	4725	4622	4810	8045	4670	4600	4850
Soil Texture[a]																										
. loose gravel	X	X	X	X			X	X				X	X		X	X				X		X	X			X
. fine gravel		X		X	X		X	X				X	X		X	X				X		X	X	X		X
. coarse sand			X			X			X	X														X		
. fine sand						X			X	X			X											X	X	
. silt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X		X	X		X	X
Disturbance[a]																										
. off-road vehicles	2		2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1		2	2	2	2	2	2	2
. gra[illegible]		1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1	1
Overall Intensity of Disturbance[b]	L	M	M	H	L	H	L	L	H	L	M	L	M	L	L	L	M			L	L	M	M	L	H	M

(a) 1 - Highest relative importance/impact; 2 - lesser relative importance/impact; 3 - least relative importance/impact.
X - Indicates Presence.
(b) H - High; M - Moderate; L - Low.
(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN CLUSTER 1 SITES DRY LAKE VALLEY, NEVADA

TABLE 3-11

Eriogonum, but the species were not identifiable during the season the survey was conducted. *Astragalus lentiginosus*, *Lepidum montanum*, and *Machaeranthera canescens* were also observed, although due to the season, the variety could not be determined.

d. Vegetation: The vegetative community in Cluster 1 is composed of shadscale/mixed shrub associations. Dominant shrubs throughout this area include rabbitbrush, winterfat, bud sage, shadscale, Mormon tea, hopsage, and four-wing saltbush. Other shrubs scattered throughout Cluster 1 include big sage, horsebrush, rubber rabbitbrush, *Lycium*, *Gutierrezia*, and *Ambrosia eriocentra*. Perennial grasses distributed throughout Cluster 1 include *Hilaria jamesii*, *Erioneuron pulchellum*, *Oryzopsis hymenoides*, *Sporobolus contractus*, and *Sporobolus cryptandrus*. Percent perennial cover in Cluster 1 ranged from 20 percent to 37 percent and averaged 29 percent.

The plant species observed in Cluster 1 are summarized in Table 3-12, and distribution of the dominant associations is mapped in Figure 3-23.

e. Wildlife: Wildlife observations in Cluster 1 are summarized in Table 3-13. Common wildlife throughout the cluster includes blacktailed jackrabbits, wild horses, leopard lizards, and side-blotched lizards. Cottontails are very common in areas bordering washes or arroyos. Species observed less frequently in Cluster 1 include the badger, coyote, kit fox, desert horned lizard, Great Basin whiptail, and sagebrush lizard. Scattered, unidentified burrows indicate the presence of additional burrowing species.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSSI	Resiting 3(a)
												Shelter Site														
ASTERACEAE																										
Ambrosia eriocentra													X									X				
Artemisia spinescens		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X		X	X	X
Artemisia tridentata							X		X		X		X									X				
Chaenactis sp.		X						X	X		X		X							X						
Chrysothamnus greenei	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X		
Chrysothamnus nauseosus		X																								
Chrysothamnus viscidiflorus						X			X																X	X
Gutierrezia microcephala					X	X																				
Tetradymia axillaris			X		X					X	X			X	X	X			X	X		X	X			
Tetradymia glabrata	X	X	X				X		X	X	X	X	X		X	X			X	X		X	X			
Tetradymia spinosa			X									X		X	X	X									X	
Iva axillaris															X											
Machaeranthera canescens		X	X		X		X	X							X	X				X	X		X	X	X	
Stephanomeria sp.				X								X														
BORAGINACEAE																										
Cryptantha sp.									X																	
Lappula sp.									X		X															

(a) Surveyed, but site not relocated.

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 1 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-12

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS1	Resiting 3
BRASSICACEAE (CRUCIFERAE)																										
Descurainia sp.		X	X					X	X	X	X				X				X	X		X	X			X
Lepidum montanum							X																			
Lepidium sp.																						X				
Streptanthus cordatus		X	X																							
CACTACEAE																										
Coryphantha vivipara		X																								
Opuntia erinacea	X														X	X				X				X		X
Opuntia echinocarpa										X		X						X	X		X					
Opuntia sp.					X	X	X		X					X						X						
CHENOPODIACEA																										
Atriplex canescens			X									X		X	X			X			X	X	X		X	
Atriplex confertifolia																X	X								X	
Ceratoides lanata	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Grayia spinosa	X		X		X		X	X	X	X		X	X	X	X			X	X	X	X	X	X		X	X
Salsola iberica						X							X		X							X		X		

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 1 SITES
DRY LAKE VALLEY, NEVADA

PAGE 2 OF 4

FIGURE 3-12

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS1	Resiting 3
EPHEDRACEAE																										
Ephedra nevadensis	X	X						X		X									X			X				X
FABIACEAE																										
Astragalus lentiginosus					X					X		X	X													
Astragalus sp.		X	X			X	X		X	X	X	X														
MALVACEAE																										
Sphaeralcea ambiqua	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X
POACEAE																										
Bromus rubens			X		X																					
Bromus tectorum		X					X	X	X				X		X				X		X	X	X		X	X
Erioneuron pulchellum					X								X						X	X		X				
Hilaria jamesii	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Oryzopsis hymenoides	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X		X	X	X
Sitanion hystrix	X	X	X		X			X	X		X	X	X			X			X	X					X	X
Sporobolus contractus													X													
Sporobolus cryptandrus																X										

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 1 SITES
DRY LAKE VALLEY, NEVADA

PAGE 3 OF 4 FIGURE 3-12

	Shelter Sites																									Resiting
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS1	3
POLYGONACEAE																										
Eriogonum sp.		X			X																	X				
Eriogonum caespitosum						X																				
Eriogonum deflexum					X	X		X			X				X						X			X	X	
Eriogonum nidularium																			X	X					X	
ROSACEAE																										
Cowania mexicana																						X				
Fallugia paradoxa		X																								
SCROPHULARIACEAE																										
Mimulus sp.					X																					
SOLANACEAE																										
Lycium andersonii		X			X				X	X	X		X						X	X		X				
Unknown mustard				X						X		X		X												

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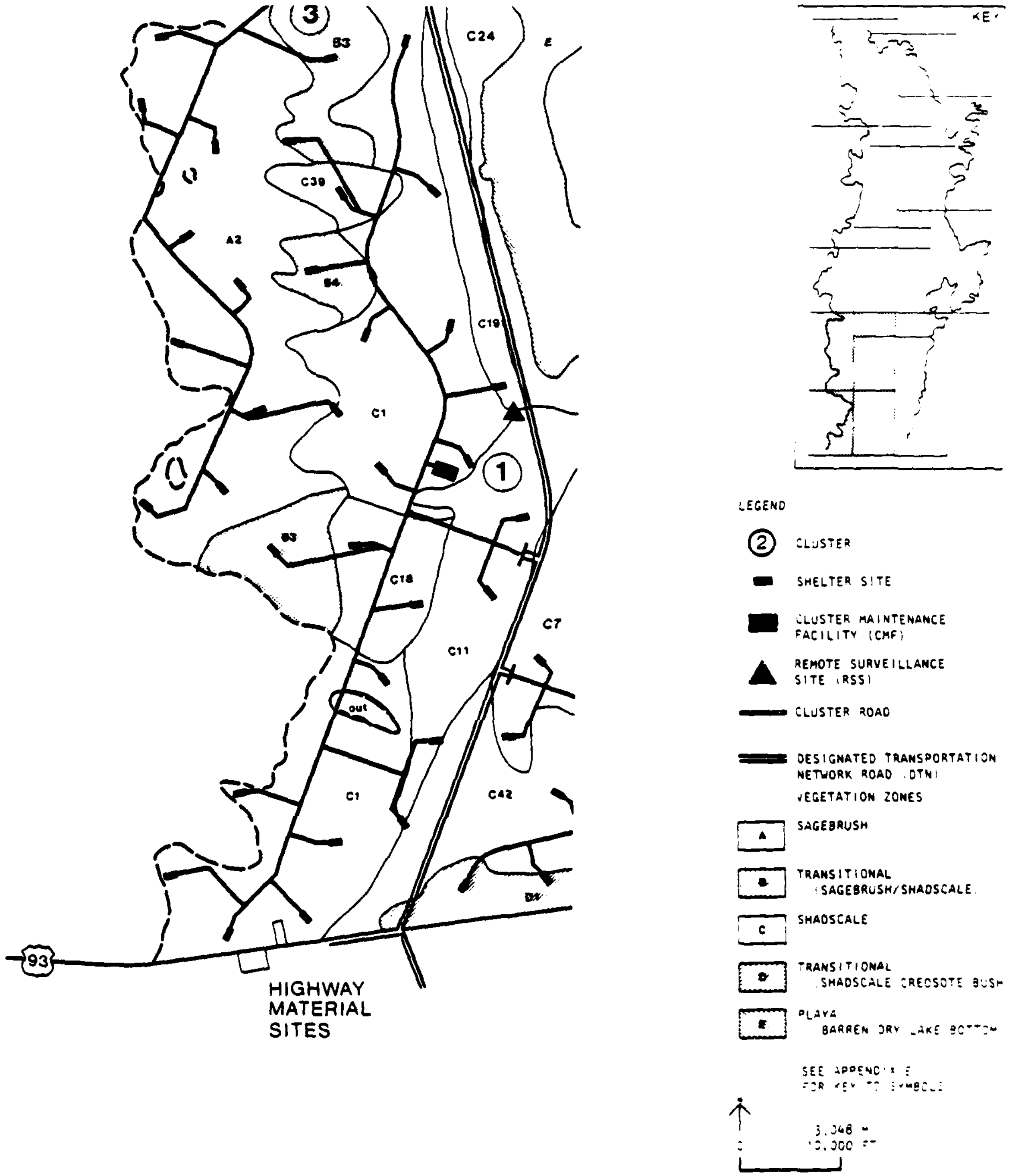
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 1 SITES
DRY LAKE VALLEY, NEVADA

FIGURE 3-12



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DOMINANT/SUBDOMINANT
VEGETATIVE ASSOCIATIONS IN CLUSTER 1

FIGURE 3-23

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS1	Resiting 3(a)
Mammals																										
Coyote (sign)			X			X					X		X									X		X	X	X
Kit fox (den)																						X		X		
Kit fox (sign)																X								X		
Badger (sign)	X								X					X								X				
Cattle (sign)			X	X	X		X	X	X	X	X	X		X		X	X	X		X	X		X			
Horse (sign)			X		X			X			X		X	X				X		X				X	X	X
Blacktail jackrabbit	1	2	6				6			1	3										2	5	2			5
Desert cottontail	1	2									1		2							3		1				
Rabbit (sign)	X	X	X		X	X	X	X	X	X	X		X		X			X		X	X		X	X		
Antelope ground squirrel (burrow)																						X				
Mammal burrows (active)		X	X	X	X					X	X		X	X	X	X	X							X	X	
Mammal burrows (inactive)		X	X																							X
Antelope (sign)																								X		
Birds																										
Horned larks							P			P		P		P		P	P				P		P			
Raven						P								P												
Sage sparrow						P																				
Meadowlark														P												
Seesee partridge																					P					
Reptiles																										
Desert horned lizard			1													1	1			1						
Long-nosed leopard lizard	1			1				1			1	1					2					1				
Side-blotched lizard	4	1		10			13	5	4		5		6		1			1		5	1	2	3	8		
Great Basin whiptail			1																			1				
Zebra-tailed lizard															1											
Sagebrush lizard																								2		

(a) Surveyed, but not relocated.
Number - actual sightings
P - Present but not counted
X - Sign observed

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 1 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-13

An introduced game bird, the Seesee partridge, was observed on Shelter Site 14. Other avian species include horned larks, sage sparrows, meadowlarks, and ravens.

3.2.5.2 Summary of Conditions in Cluster 2

a. Abiotic Conditions: The legal descriptions for Cluster 2 are given in Appendix F. Elevations range from 4580 to 4905 feet (1409 to 1509 m), and all survey areas are located on slopes of approximately 3 degrees. The soil at all sites is alluvial, composed of fine sand and silt loam. The vegetation indicates that the soil is alkaline. Abiotic conditions within the cluster are summarized in Table 3-14.

b. Disturbance: The majority of the proposed shelter sites in Cluster 2 are moderately disturbed by grazing (noted at 10 sites) and vehicle tracks (noted at 22 sites). Shelter Sites 2, 3, 10, 13, 21, and 22 were considered highly disturbed. Low level disturbance was noted on Sites 8 and 11, and erosion is evident on Sites 8, 13, and 14. *Salsola* was present on eight sites and *Halogeton* on five sites.

c. Threatened or Endangered Plant Species: Individuals of *Coryphantha vivipara* are located on Shelter Sites 3, 22, and 23. This species is listed in the 1980 Federal Register as a Taxon Currently Under Review, Category 2 (see Section 3.2.2). Other possible threatened or endangered plants, including *Opuntia*, *Gilia*, *Astragalus*, *Eriogonum*, *Sphaeralcea*, *Machaeranthera*, *Camissonia*, *Oenothera*, *Erigeron*, and *Cryptantha*, were also

Shelter Site Number	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Resitings CMF	6(c)	9(c)	22	23
Elevation (feet)	4855	4905	4810	4722	4860	4680	4800	4690	4660	4603	4715	4595	4605	4580	4600	4586	4581	4610	4680	4645	4668	4772	4825		4670	4660	4770	4825
Soil Texture (a)																												
. course gravel																								X	X			X
. fine gravel																								X	X			
. course sand			X								X																	
. fine sand	X	X	X	X	X		X				X	X		X				X		X								
. silt	X					X		X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Disturbance(a)																												
. offroad vehicles	1	1	2	1	1	1	1	1	2	2	1	1	3		2	2	2	1	2	1	2	2	1		2	2	3	
. erosion								2	3				2	1										2			2	
. grazing	1	1	1	1	1	1	1	1	1	1			1		1	1	1	2	1	2	1	1		1	1	1	1	1
Overall Intensity of Disturbance(b)	M	H	H	M	M	M	M	L	M	H	L	M	H	M	M	M	M	M	M	M	H	H	M	M	M	M	H	M

(a) 1 - Highest relative importance/impact; 2 - lesser relative importance/impact; 3 - lowest relative importance/impact .
X - Indicates Presence
(b) H - High; M - Moderate; L - Low.
(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN CLUSTER 2 SITES DRY LAKE VALLEY, NEVADA

TABLE 3-14

observed, but species could not be identified due to the season that the survey was conducted. Lepidum montanum, Astragalus lentiginosus, Gutierrezia sarothrae, and Machaeranthera canescens were also present, but due to the season, the variety could not be determined.

d. Vegetation: The plant communities in Cluster 2 are characteristic of the shadscale scrub and Alkali sink scrub vegetation zones. The greasewood (Sarcobatus) association has been noted as the most extensive salt-tolerant community in the Great Basin. It usually occurs in the bottoms of the valleys, in saline clay soils around the margin of playas (Cronquist and others, 1972). This community is dominant in Shelter Site 2/14.

Pure stands of winterfat (Ceratoides lanata) occur on Shelter Sites 6, 8, 9, and 15. Other dominant shrubs in this cluster include hop sage, rabbitbrush, four-wing saltbush, Mormon tea, rubber rabbitbrush, gray molly, bud sage, horsebrush, and Lycium. A perennial grass, galleta grass, is a dominant species at several sites, and other perennial grasses are scattered throughout cluster.

Perennial vegetative cover in Cluster 2 ranges from eight to 33 percent, and averages 23 percent.

The Joshua tree (Yucca brevifolia) is distributed in the southern portion of Cluster 2. Jaeger (1972) has stated that this species marks the limits of the Mojave desert better than any other plant. It is absent from northern and central Dry Lake

Valley, where vegetation is more characteristic of the Great Basin.

Plant species observed in Cluster 2 are summarized in Table 3-15, and distribution of the dominant associations is mapped in Figure 3-24.

e. Wildlife: Wildlife observations in Cluster 2 are summarized in Table 3-16. The side-blotched lizard, horned lark, and blacktailed jackrabbit are ubiquitous species. Species less commonly sighted include the leopard lizard, cactus wren, Gambels quail, vesper sparrow, sage sparrow, raven, and desert cottontail.

Characteristic burrows indicate the presence of badgers, ground squirrels, and kit foxes. Scattered, less characteristic burrows indicate the presence of additional unidentified burrowing species.

3.2.5.3 Summary of Conditions in Cluster 3

a. Abiotic Conditions: The legal descriptions for sites in Cluster 3 are given in Appendix F. Elevations range from 4610 to 5155 feet (1418 to 1586 m), and all survey areas are located on slopes of approximately 3 degrees. The soil is alluvial, predominantly silt and sand. Small gravel overlays the soil surface in most areas. Abiotic conditions within the cluster are summarized in Table 3-17.

b. Disturbance: Low to moderate disturbance is present at all Shelter Sites, except 5 and 23, where disturbance is considered

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	Resitings 6(a)	9(a)	Resitings 22	Resitings 23
AGAVACEAE																												
Yucca brevifolia	X	X			X																							
ASTERACEAE (COMPOSITAE)																												
Ambrosia acanthicarpa		X																										X
Ambrosia eriocentra																												X
Artemisia spinescens	X			X	X	X	X	X	X	X	X		X		X			X	X	X	X	X	X	X	X	X	X	X
Aster sp.											X																	
Baileya pleniradiata		X					X																					
Chaenactis sp.	X		X	X	X			X																				
Chrysothamnus greenei		X	X	X	X		X	X	X		X		X		X			X	X	X	X		X	X				
Chrysothamnus nauseosus	X																						X					
Chrysothamnus viscidiflorus																										X	X	X
Dyssodia papposa	X	X	X																									
Erigeron sp.																												X
Gutierrezia microcephala																					X	X	X					
Gutierrezia sarothrae																								X			X	
Lygodesmia sp.																						X						
Machaeranthera canescens	X			X	X			X	X		X		X												X	X		
Machaeranthera sp.																								X				
Psathyrotes annua		X	X	X	-																							
Stephanomeria sp.	X			X																								
Tetradymia axillaris	X	X									X												X					
Tetradymia glabrata					X		X				X										X	X						
Tetradymia spinosa																					X			X			X	X
Viguiera multiflora																							X				X	
BORAGINACEAE																												
Cryptantha sp.	X	X	X																									X
Lappula redowskii																				X								
Lappula sp.					X	X		X																				

(a) Surveyed but not relocated.

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 2 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-15

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings 6	9	22	23
BRASSICACEAE (CRUCIFERAE)																												
Caulanthus pilosus																						X						
Descurainia sp.	X	X						X																			X	
Lepidium montanum						X																						
Sisymbrium sp.																								X				
Stanleya pinnata					X																							
Unknown mustard					X																							
CACTACEAE																												
Coryphantha vivipara																											X	
Opuntia erinacea	X													X	X										X		X	
Opuntia echinocarpa	X	X			X						X											X	X					X
Opuntia sp.													X						X			X	X	X				
CAPRIFOLIACEAE																												
Symphoricarpos sp.				X																								
CHENOPODIACEAE																												
Atriplex canescens		X			X			X		X	X								X				X				X	
Atriplex confertifolia										X		X	X	X		X	X	X			X							
Ceratoides lanata	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Grayia spinosa	X	X	X	X			X				X											X	X				X	X
Halogeton glomeratus								X		X			X	X	X													
Kochia americana																X	X											
Salsola iberica	X					X			X				X	X	X			X								X		
Salsola sp.																								X				
Sarcobatus vermiculatus														X														
Suaeda torreyana																X												

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 2 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-15

	Shelter Site																								Resitings			
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	6	9	22	23
EPHEDRACEAE																												
Ephedra nevadensis		X																				X	X				X	X
EUPHORBIACEAE																												
Euphorbia sp.	X	X									X																	
FABIACEAE (LEGUMINOSAE)																												
Astragalus lentiginosus	X	X																										
Astragalus sp.					X						X																	
RANUNCULACEAE																												
Delphinium sp.																						X						
MALVACEAE																												
Sphaeralcea ambigua																						X			X	X	X	X
Sphaeralcea sp.	X			X	X		X	X	X		X													X				
NYCTAGINACEAE																												
Mirabilis sp.	X				X																							
ONAGRACEAE																												
Camissonia sp.																							X					
Oenothera sp.	X																											
POACEAE (GRAMINAE)																												
Aristida purpurea					X																	X	X					
Bouteloua sp.													X															
Bromus rubens			X						X		X																	
Bromus tectorum				X			X				X								X	X	X	X	X		X	X	X	
Erioneuron pulchellum					X						X											X	X				X	X

SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 2 SITES
DRY LAKE VALLEY, NEVADA

Species	Shelter Site																							Resitings			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	6	9	22	23
Hilaria jamesii	X	X	X	X		X	X		X		X		X		X			X			X	X	X	X	X	X	X	X
Oryzopsis hymenoides	X	X	X	X				X	X	X	X							X	X		X	X	X	X	X	X	X	
Sitanion hystrix	X			X	X		X	X			X							X			X	X		X	X		X	X
Sitanion sp.																X	X											
Sporobolus contractus	X		X																							X		
Sporobolus cryptandrus		X	X	X	X	X	X		X				X								X			X		X		
Sporobolus sp.																		X										
Stipa sp.																						X						
POLEMONIACEAE																												
Eriastrum sp.																							X					
Gilia sp.	X		X		X				X													X	X					
Langoisia sp.																					X							
POLYGONACEAE																												
Eriogonum cernuum																												
Eriogonum deflexum	X														X									X		X		
Eriogonum nidularium		X	X																			X						
Eriogonum sp.									X				X						X									
Unknown shrub										X																		
ROSACEAE																												
Prunus fasciculata																							X					
SCROPHULARIACEAE																												
Mimulus sp.																							X					
Penstemon palmeri	X																											
SOLANACEAE																												
Lycium andersonii	X	X			X		X				X											X	X				X	X

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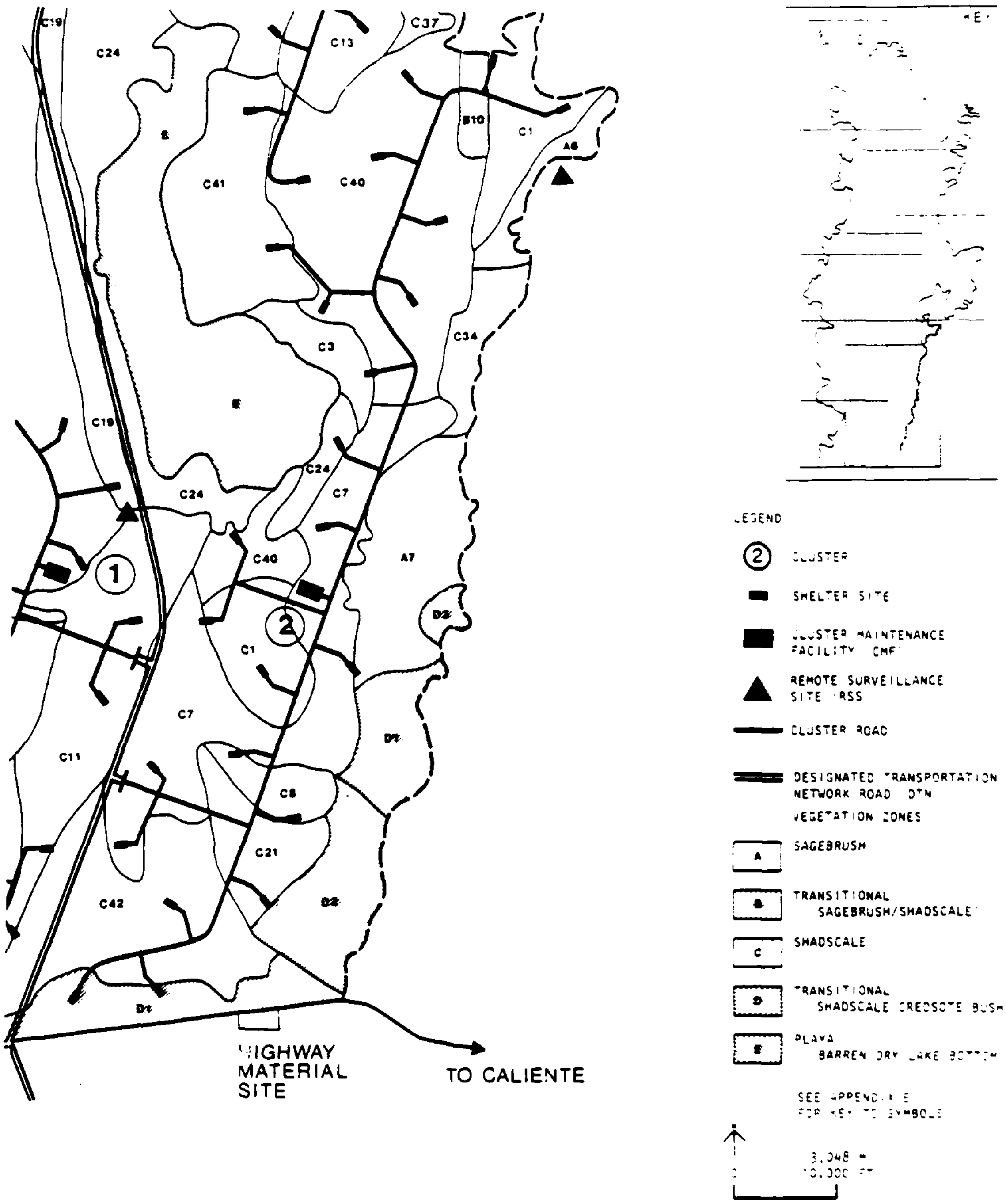
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 2 SITES
DRY LAKE VALLEY, NEVADA

PAGE 4 OF 4 TABLE 3-15



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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 2

FIGURE 3-24

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings 6(a)	9(a)	22	23
Mammals																												
Coyote (sign)				X		X																			X			
Blacktail jackrabbit	9	8	4		3				1					7							1	1	6			1	1	4
Desert cottontail	2	1	1																				2					
Rabbit (sign)	X	X	X	X	X	X	X		X			X		X				X				X		X	X	X	X	X
Ground squirrel		1																										
Ground squirrel (sign)																											X	X
Small mammal burrows (active)				X	X	X	X	X	X		X	X	X		X							X		X		X	X	X
Small mammal burrows (inactive)						X			X										X			X	X	X	X	X	X	X
Horse (sign)						X																	X		X			
Cattle (sign)							X	X	X			X	X	X		X	X	X				X						
Kit fox (den)									X																	X		
Badger (sign)																		X										
Birds																												
Horned larks			1	1	1	19		2	1	6	2		6		14	4	3	2	2					P	P	P		
Raven																							1					
Sage sparrow		2																										
Vesper sparrow				1																								
Gambel's quail																		2										
Cactus wren		1																										
Reptiles																												
Side-blotched lizard	14	1	3	3	8	1	9	6	1		1		3					3	10				3	P				2
Long nosed leopard lizard		2		1					1				1															

(a) Surveyed but not relocated.
Number - Actual sightings.
P - Present but not counted.
X - Sign observed.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 2 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-16

Factor	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	HSS2	Resitings 1	5	14(c)
Elevation (feet)	5145	4995	4892	4775	5010	4920	5035	4975	5155	5105	4740	4732	5066	5025	4707	4800	4630	4785	4610	4675	4655	4735	4703	4730	4800	5210	5070	5215
Soil Texture(a)																												
Rocks																											X	
Coarse gravel					X					X										X	X	X		X	X	X	X	X
Fine gravel	X	X	X	X	X		X	X		X	X	X	X	X	X	X		X	X									X
Coarse sand	X	X	X	X	X	X	X	X	X					X						X	X	X	X	X		X		X
Fine sand	X	X	X	X	X	X	X	X	X		X	X		X			X			X	X	X	X		X		1	X
Silt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			1
Clay																										1		X
Disturbance(a)																												
Offroad vehicles	2	2	2	1		2	2	2			1	1	1	1	1	2	2	2	1	2	2	2	2			2	2	1
Erosion	3	3					3																					2
Grazing	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	2
Overall Intensity of Disturbance(b)	M	M	M	M	H	M	–	M	M	L	L	L	L	L	M	L	M	L	M	M	M	M	H	L	M	M	L	M

(a) 1-Highest relative importance/impact; 2-lesser relative importance/impact; 3-lowest relative importance/impact.
X-Indicates presence
(b) H-High; M-Moderate; L-Low
(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN CLUSTER 3 DRY LAKE VALLEY, NEVADA

TABLE 3-17

high. Grazing is the dominant cause of disturbance in 16 sites, and off-road vehicle damage is the major factor in the others. Erosion was observed on Sites 1, 2, and 7.

Halogeton glomeratus and Salsola iberica, invaders in disturbed areas, were found only on Sites 17, 13, and 14.

c. Threatened or Endangered Plant Species: Individuals of Coryphantha vivipara were sighted on Shelter Sites 1 and 14. This species is listed in the 1980 Federal Register as a Taxon Currently Under Review. It is a Category 2 plant as described previously. Unidentified individuals of Eriogonum, Opuntia, Gilia, Camissonia, Happlopappus, Lepidum, Mentzelia, Astragalus, and Cryptantha were also observed, but species could not be determined due to the season of the survey. Gutierrezia sarothrae, Astragalus lentiginosus, Lepidium montanum, and Machaeranthera canescens were also observed although due to the season, the variety could not be determined.

d. Vegetation: Cluster 3 is located at somewhat higher elevations and is characteristic of the Big Sagebrush zone. Big sagebrush dominates Shelter Sites 1 through 3, 5 through 9, 13, and 14. Other important shrub species include rabbitbrush, hop sage, bud sage, and horsebrush. At lower elevations in this cluster, shadscale associations are prevalent as in Shelter Sites 16, 18, and 21 through 23. Galleta grass is often a codominant in the shadscale zones. The perennial vegetative cover in the cluster ranges from 16 to 32 percent and averages 24 percent.

Plant species observed within Cluster 3 are presented in Table 3-18, and distribution of the dominant associations is mapped in Figure 3-25.

e. Wildlife: Wildlife observations in Cluster 3 are summarized in Table 3-19. Characteristic burrows indicate the presence of badgers, kit foxes, and coyotes. Less characteristic burrows indicate the presence of additional unidentified burrowing species throughout the cluster. Horse and cattle sign were fairly common, and rabbit activity was ubiquitous.

Avian species included the horned lark, raven, and sparrow as well as three raptor species, the northern harrier, prairie falcon, and turkey vulture. Reptiles were represented by six lizard species.

3.2.5.4 Summary of Conditions in Cluster 4

a. Abiotic Conditions: The legal descriptions for Cluster 4 are given in Appendix F. Elevations range from 4580 to 4680 feet (1409 to 1440 m), and all survey areas are located on slopes of approximately 3 degrees. The soil is alluvial, composed of silt, fine and coarse sand, and fine gravel. Abiotic conditions for each site within the cluster are summarized in Table 3-20.

b. Disturbance: Grazing is the major cause of disturbance on all shelter sites except Shelter Sites 7 and 11. Off-road vehicle damage has caused secondary disturbance on all shelter sites except 7 and 11, where it exceeds grazing as the primary

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS2	Resitings 1	5	14(a)
AGAVACEAE																												
Yucca baccata	X						X			X																X	X	
ASTERACEAE (COMPOSITAE)																												
Ambrosia eriocentra							X	X								X												
Artemisia spinescens			X	X				X			X	X		X	X	X	X	X	X			X	X	X				X
Artemisia tridentata	X	X	X	X	X	X	X	X	X	X			X	X		X										X	X	X
Chaenactis sp.																			X	X								
Chrysothamnus greenei	X	X	X	X			X				X	X		X	X		X		X	X	X	X						
Chrysothamnus nauseosus			X	X																								
Chrysothamnus viscidiflorus	X		X		X	X		X	X	X			X			X		X					X	X	X	X	X	X
Gutierrezia microcephala								X		X									X									
Gutierrezia sarothrae																											X	
Haplopappus sp.							X	X																				
Iva axillaris																							X					
Machaeranthera canescens												X			X	X	X	X	X			X	X					
Psathyrotes annua			X																									
Tetradymia axillaris			X	X							X					X		X				X					X	
Tetradymia canescens										X																		
Tetradymia glabrata		X	X	X	X	X	X				X					X		X		X		X		X		X	X	
Viguiera multiflora	X						X												X	X							X	
BERBERIDACEAE																												
Berberis fremontii																										X		
BORAGINACEAE																												
Cryptantha sp.								X											X									
Lappula occidentalis																				X								
BRASSICACEAE (CRUCIFERAE)																												
Caulanthus pilosus							X		X								X											
Descurainia sp.		X									X	X					X	X	X									
Lepidium montanum																	X											
Lepidium sp.																X												
Stanleya pinnata				X			X																			X		
Unknown mustard	X	X			X																							

(a) Surveyed but site not relocated.

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 3 SITES
DRY LAKE VALLEY, NEVADA

PAGE 1 OF 3

TABLE 3-18

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS2	Resitings 1	5	14
CACTACEAE																												
Coryphantha vivipara														X														
Echinocereus engelmannii										X				X														
Opuntia erinacea	X			X			X	X	X	X	X	X		X			X		X			X		X	X	X	X	
Opuntia echinocarpa	X	X		X			X	X	X	X	X							X								X		X
Opuntia sp.																								X				
CHENOPODIACEAE																												
Atriplex canescens				X							X				X	X		X	X	X	X		X	X				
Atriplex confertifolia																	X		X	X			X					
Ceratoides lanata				X								X			X	X	X	X	X	X	X	X	X	X	X			
Grayia spinosa	X		X	X	X		X	X	X	X	X	X	X	X	X	X		X		X	X	X		X	X	X	X	X
Halogeton glomeratus																	X											
Salsola iberica															X				X									
CUPRESSACEAE																												
Juniperus osteosperma																										X		
EPHEDRACEAE																												
Ephedra nevadensis	X	X		X	X		X	X	X	X	X		X	X		X										X	X	X
EUPHORBIACEAE																												
Euphorbia sp.	X	X	X	X									X	X												X		
FABIACEAE (LEGUMINOSAE)																												
Astragalus lentiginosus							X	X		X			X												X	X	X	X
Astragalus sp.	X	X	X	X	X				X	X	X			X				X	X		X							
LOASACEAE																												
Mentzelia sp.																	X											
MALVACEAE																												
Sphaeralcea ambigua				X						X	X	X	X		X	X	X	X	X			X	X	X	X			

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 3 SITES
DRY LAKE VALLEY, NEVADA

PAGE 2 OF 3

TABLE 3-18

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS2	Resitings 1	5	14
ONAGRACEAE																												
Camissonia sp.		X																										
POACEAE (GRAMINAE)																												
Bromus rubens																			X									
Bromus tectorum	X		X		X		X	X		X	X	X	X		X			X	X	X	X	X	X	X	X		X	
Erioneuron pulchellum				X							X	X			X	X		X				X		X	X			
Erioneuron pilosum																								X				
Hilaria jamesii			X	X							X	X		X	X	X		X	X	X	X	X	X	X	X		X	
Muhlenergia cooperi														X		X												
Oryzopsis hymenoides			X	X		X				X	X	X		X	X	X	X	X		X	X	X	X	X	X			X
Sitanion hystrix	X		X		X		X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X
Sitanion jubatum																								X	X			
Sporobolus contractus																									X			
Sporobolus cryptandrus											X					X			X			X						
POLEMONIACEAE																												
Gilia sp.	X						X	X																				
POLYGONACEAE																												
Eriogonum deflexum			X								X				X		X						X					
Eriogonum nidularium		X										X						X				X					X	
Eriogonum sp.			X									X						X	X		X		X				X	
ROSACEAE																												
Cowania mexicana		X			X		X	X	X				X													X		
SCHROPHULARIACEAE																												
Mimulus sp.			X	X																								
SOLANACEAE																												
Lycium andersonii	X		X	X		X		X	X	X	X		X	X		X		X				X			X			

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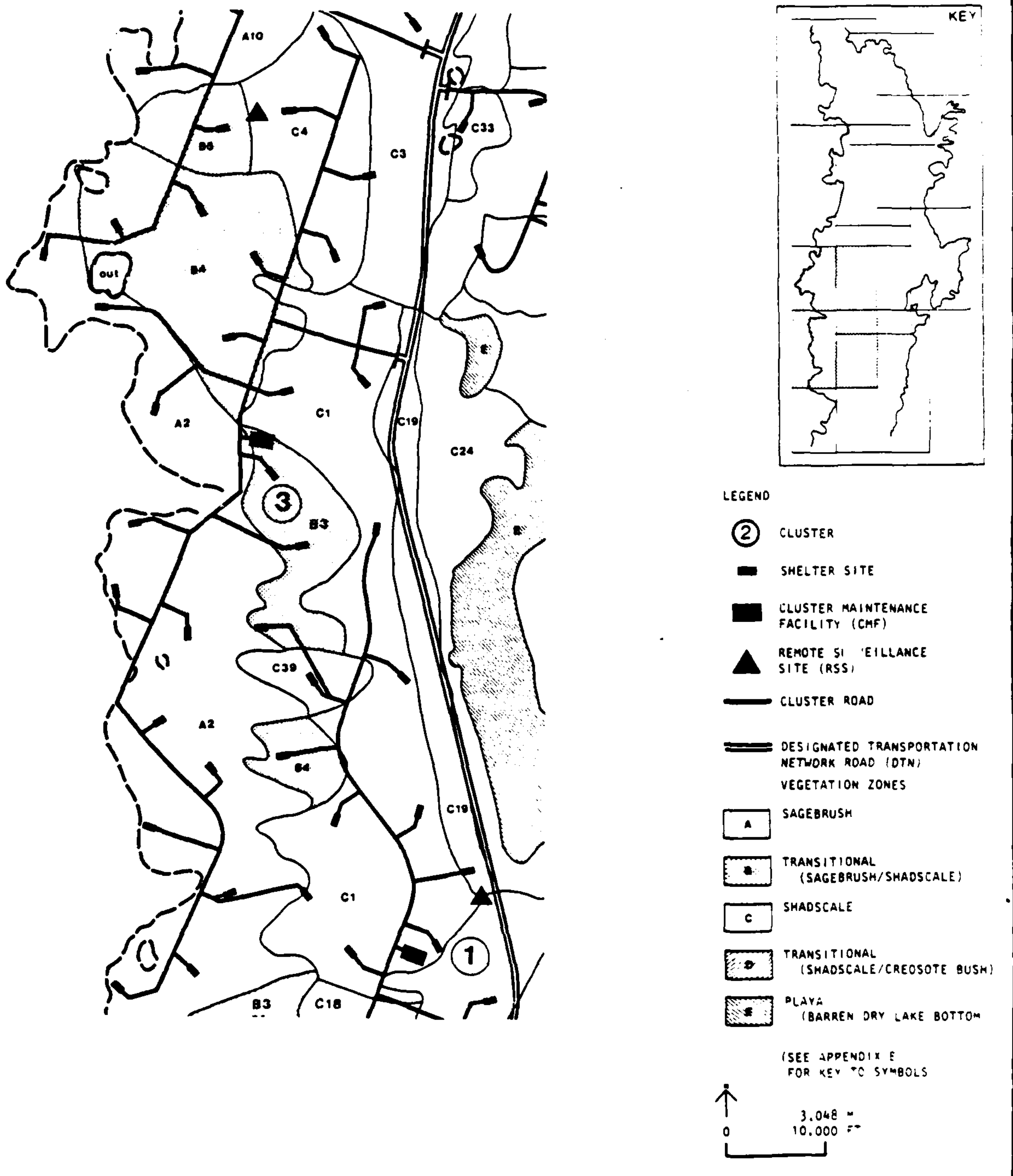
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 3 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-18



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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 3

FIGURE 3.25

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS2	Resitings 1	5	14(a)
	Shelter Site																											
Mammals																												
Coyote (active den)					X																							
Coyote (inactive den)																											X	
Coyote (sign)	X				X				X	X			X	X						X	X			X		X	X	
Kit fox (active den)				X																								
Kit fox (sign)				X																								
Blacktail jackrabbit	1	1		1	1	4		1					3	1		1		1		1				P			1	
Desert cottontail		1			1			1				1		1													1	
Rabbit (sign)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Cattle (sign)		X	X		X	X						X					X	X	X		X	X	X					
Horse (sign)									X			X						X					X	X	X			
Mammal burrows (active)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Mammal burrows (inactive)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Badger (burrow)														X	X											X		
Birds																												
Horned lark				2									1		1		2	1	6		4			P				
Raven		1		1																								
Sparrow						1																						
Northern harrier												1				1			1				1					
Prairie Falcon										1		1																
Turkey Vulture											3																	
Reptiles																												
Side-blotched lizard		6	4	2		5	1	3	3	6	6	9	2	8	19	4	1	5	3	8	10	16	1					
Long-nosed leopard lizard			1			2		1		1																		
Desert horned lizard							1																					
Great Basin whiptail																							7					
Sagebrush lizard													3															
Zebra-tailed lizard																	2											

(a) Surveyed but not relocated.
Number = Actual sightings; P = Present but not counted; X = sign observed.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 3 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-19

	Shelter Site																									Resitings					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS3	1	2	3	4	22
Elevation (feet)	4601	4585	4580	4620	4630	4592	4594	4585	4600	4600	4602	4620	4605	4680	4615	4615	4620	4620	4640	4630	4630	4630	4639	—	4635	4595	4585	—	4630	4625
Soil Texture(a)																														
Coarse gravel																													X	-
Fine gravel	X														X															-
Coarse sand			X		X		X		X	X	X				X		X		X										X	-
Fine sand		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X		X					-
Silt	X	X	X	X	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	-
Disturbance(a)																														
Offroad vehicles	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2		2	1	2	2	
Grazing	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Overall Intensity of Disturbance(b)	M	M	M	M	L	L	L	M	M	L	L	L	L	L	M	L	L	L	L	M	M	M	M	L	M	M	L	H	M	L

(a) 1-Highest relative importance/impact; 2-lesser relative importance/impact; 3-lowest relative importance/impact.
X-Indicates presence
(b) H-High; M-Moderate; L-Low

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SUMMARY OF ABIOTIC FACTORS IN
CLUSTER 4
DRY LAKE VALLEY, NEVADA

TABLE 3-20

disturbance in the area. The intensity of disturbance is considered low to moderate on all sites.

Halogeton glomeratus and Salsola iberica are widespread in Cluster 4, being found in 14 and 7 sites, respectively.

c. Threatened or Endangered Plant Species: Individuals of Sclerocactus pubispinus, the Great Basin fishhook cactus, were observed on Site 4. This species is listed as a Taxon Currently Under Review in the 1980 Federal Register. It is a Category 1 plant, which indicates sufficient information is available to support its listing as a threatened or endangered species, although final publication of rules will require several years. Other possible threatened and endangered species included Eriogonum, Phacelia, Sphaeralcea, Camissonia, Lepidium, Echinocereus, Penstemon, Astragalus, Opuntia, and Cryptantha, but the species could not be identified due to the season of the survey. Eriogonum microthecum, Machaeranthera canescens, Gutierrezia sarothrae, and Astragalus lentiginosus were also present, although due to the season, the variety could not be determined.

d. Vegetation: The lower elevation of the cluster on the valley floor bordering the playas and the presence of saline, alkaline soils are both conditions that tend to support shadscale and alkali sink scrub vegetation associations. The dominant shrubs are bud sage, four-wing saltbush, gray molly, greasewood, saltbrush, rabbitbrush, and Gutierrezia; Eriogonum microthecum was dominant in many wash areas. Perennial codominant grasses

include Indian rice grass (Oryzopsis hymenoides), galleta grass (Hilaria jamesii), and squirrel grass (Sitanion hystrix).

The perennial vegetative cover in Cluster 4 ranges from 10 to 25 percent and averages 19 percent.

The plant species observed in Cluster 4 are summarized in Table 3-21, and distribution of dominant associations is mapped in Figure 3-26.

e. Wildlife: Wildlife observations in Cluster 4 are summarized in Table 3-22. Characteristic burrows identified the presence of badgers, kangaroo rats, gophers, and Townsend and antelope ground squirrels. Less characteristic mounds indicate the presence of additional, unidentified burrowing species throughout the cluster. Scat indicated the presence of antelope, rabbit, coyote, kit fox, and badger.

The sagebrush and side-blotched lizards were the most common reptiles; less common reptiles included the desert horned lizard, Great Basin whiptail lizard, sagebrush lizard, and gopher snake.

Although horned larks were ubiquitous, few other bird species were present. One burrowing owl was observed in its den on Site 21, and ravens were also observed.

3.2.5.5 Summary of Conditions in Cluster 5

a. Abiotic Conditions: The legal descriptions for sites in Cluster 5 are given in Appendix F. Elevations range from 4640

	Shelter Site																								Resitings				
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS3	1	2	3	4	22
ASTERACEAE (COMPOSITAE)																														
Ambrosia acanthicarpa																				X										
Artemisia spinescens	X	X	X	X	X	X	X	X			X		X	X		X	X		X			X		X		X			X	X
Artemisia tridentata						X		X						X					X		X									X
Chrysothamnus greenei			X	X	X	X	X	X			X	X	X	X		X	X	X	X		X	X	X							X
Chrysothamnus viscidiflorus																										X				
Gutierrezia sarothrae			X		X							X		X				X		X			X						X	
Gutierrezia microcephala																					X	X	X							
Gutierrezia sp.	X			X					X																					
Machaeranthera canescens			X	X	X	X	X				X		X		X	X		X	X	X		X	X	X					X	X
Psathyrotes annua	X		X																											
Tetradymia axillaris			X															X			X	X				X				
Tetradymia glabrata			X		X	X	X	X						X		X	X	X			X	X	X						X	X
Tetradymia spinosa	X		X	X		X		X						X				X								X			X	X
BORAGINACEAE																														
Cryptantha sp.				X											X															
BRASSICACEAE (CRUCIFERAE)																														
Lepidium montanum			X		X	X	X		X	X			X	X		X	X	X	X		X	X	X							
Lepidium sp.																														X
Stanleya pinnata			X						X									X												
Descurainia pinnata																							X			X				
Descurainia sp.	X			X		X	X	X		X			X			X	X	X		X		X			X					
CACTACEAE																														
Echinocereus sp.					(dead)																									
Opuntia erinacea	X			X	X		X			X				X	X		X		X	X					X				X	
Opuntia sp.															X							X								X
Sclerocactus pubispinus				X																										

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 4 SITES
DRY LAKE VALLEY, NEVADA

PAGE 1 OF 3

TABLE 3-21

	Shelter Site																								Resitings				
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS3	1	2	3	4	22
CHENOPODIACEAE																														
Atriplex canescens	X				X	X		X	X	X		X	X	X		X	X	X		X	X	X	X		X	X	X			X
Atriplex confertifolia	X	X	X	X		X	X	X		X	X		X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X
Ceratoides lanata	X			X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X		X	X			X	X
Grayia spinosa				X																										
Halogeton glomeratus		X	X			X		X		X	X		X	X		X	X	X	X		X	X				X		X		X
Kochia americana		X	X			X	X	X			X		X	X		X	X	X	X		X	X		X		X	X	X		
Salsola iberica	X	X						X		X				X					X	X					X	X				X
Sarcobatus vermiculatus		X	X					X										X	X		X	X								
Suaeda torreyana		X																												
EUPHORBIACEAE																														
Euphorbia sp.			X						X																					
FABIACEAE (LEGUMINOSAE)																														
Astragalus lentiginosus																														X
Astragalus sp.																							X							
HYDROPHYLLACEAE																														
Phacelia sp.									X																					
LAMIACEAE																														
Salvia dorii																						X								
MALVACEAE																														
Sphaeralcea ambigua	X			X	X	X	X				X		X	X	X	X	X	X			X		X						X	
Sphaeralcea sp.																								X						
ONAGRACEAE																														
Camissonia sp.																														X

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 4 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-21

	Shelter Site																									Resitings				
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS3	1	2	3	4	22
POACEAE (GRAMINAE)																														
Bromus rubens				X																										
Bromus tectorum	X		X	X		X	X			X	X		X	X	X		X		X	X		X			X	X		X		X
Hilaria jamesii			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X		X				X
Oryzopsis hymenoides	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X
Sitanion hystrix	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Sporobolus airoides							X																							
Sporobolus cryptandrus															X															
Sporobolus sp.						X																								
Stipa comata							X																							
Vulpia octoflora																				X										
POLEMONIACEAE																														
Ipomopsis congesta																								X						
Langosia sp.				X																										
Leptodactylon pungens							X									X						X								
POLYGONACEAE																														
Eriogonum microthecum																							X							
Eriogonum caespitosum			X																											
Eriogonum deflexum			X	X			X			X	X	X	X			X		X	X		X	X	X		X			X		
Eriogonum sp.	X	X			X										X				X											X
SCROPHULARIACEAE																														
Penstemon sp.			X											X		X					X		X							
SOLANACEAE																														
Lycium andersonii																			X											

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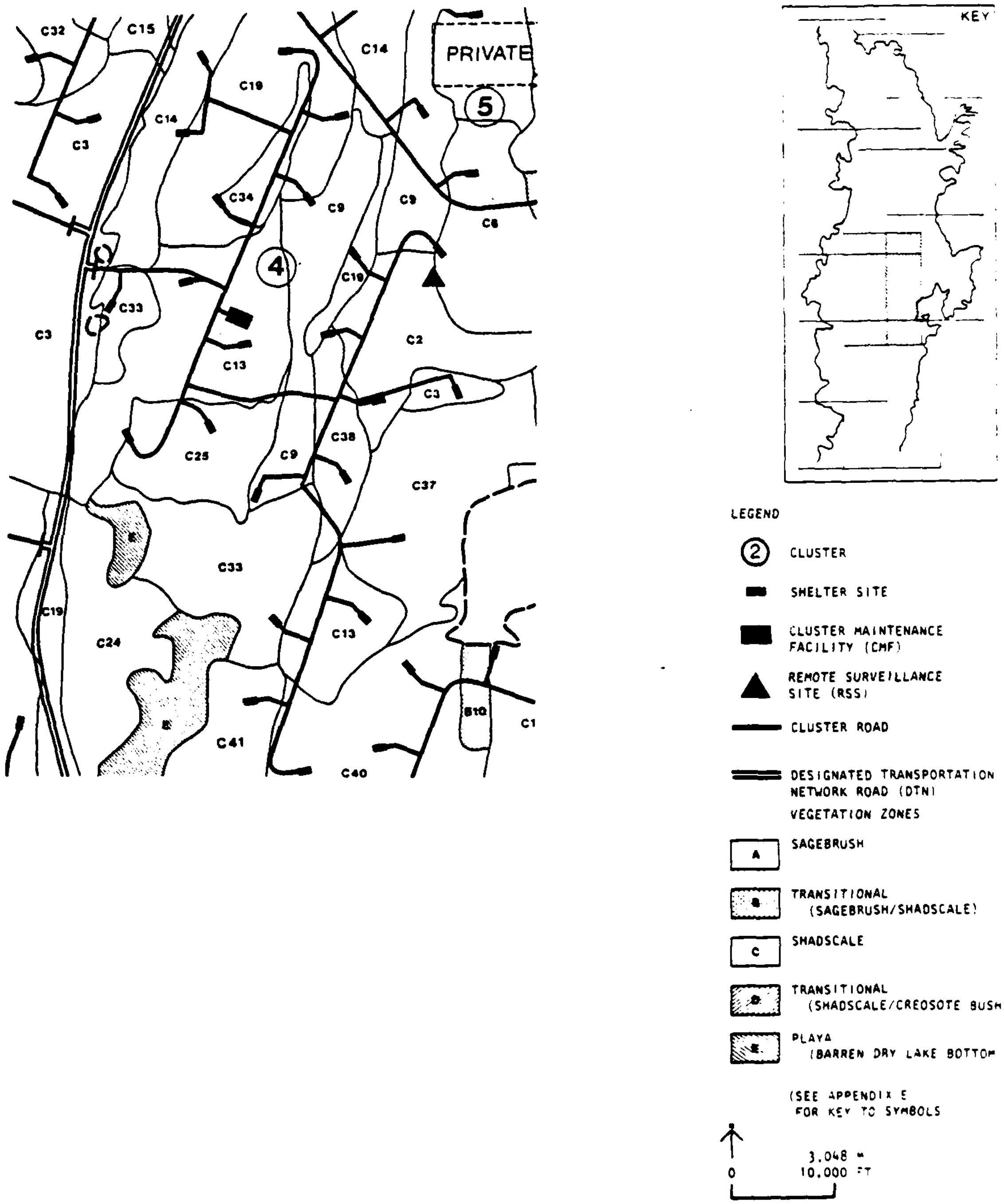
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 4 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-21



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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 4

FIGURE 3 26

	Shelter Site																									Resitings				
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS3	1	2	3	4	22
Mammals																														
Horse (sign)										X	X	X					X													
Antelope (sign)												X																		
Coyote (sign)		X	X			X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X				X	X		X
Kit fox (sign)						X	X				X		X		X															
Badger (sign)	X							X																						
Bobcat (sign)								X																						
Blacktail jackrabbit					1	1	3	3			2		3					8	2	1	2	4	1							3
Desert cottontail				1																										
Rabbit (sign)	X	X	X	X	X		X	X	X	X			X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X
Mammal burrow (active)	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
Mammal burrow (inactive)	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X		X	X	X	X	X	X
Kangaroo rat burrow (active)				X	X																									
Antelope ground squirrel burrow (active)	X			X																										
Townsend ground squirrel (active burrow)																				X										
Gopher burrow (active)						X			X																					
Birds																														
Horned lark (numerous)	P	P	P			P	P	P	P		P	P		P	P	P	P	P	P	P	P	P	P		P	P	P	P	P	P
Raven						1			1								1	1												
Burrowing owl																					1									
Golden eagles																								6†						
Reptiles																														
Side-blotched lizard				3			5				2		1	3			2					4		2					1	5
Desert horned lizard																1														
Great Basin whiptail														2																
Sagebrush lizard				8		6	11						2	8	4	2	1	6	2				6							
Unidentified lizard											1																			
Gopher snake	1											1																		

Number = Actual sightings; P = Present but not counted; X = Sign observed; † = Seen near site.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 4 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-22

to 5785 feet (1428 to 1780 m), and most survey areas are located on slopes of approximately 3 degrees. The soil is alluvial, dominated by silt and fine sandy loams. Some coarse sand and fine gravel are also present. Abiotic conditions within the cluster are summarized in Table 3-23.

b. Disturbance: Grazing is the primary cause of disturbance, followed by off-road vehicle usage on Sites 2 through 8, 10 through 16, and 20 through 22. Off-road vehicle damage is the primary disturbance followed by grazing on Sites 1, 9, and 17 through 19. Disturbance is low to moderate on all sites except Site 4 which appears highly disturbed.

c. Threatened or Endangered Plant Species: Two individuals of *Coryphantha vivipara* were observed on Site 18. This species is listed in the 1980 Federal Register as a Taxon Currently Under Review. It is a Category 2 plant as described previously. Individuals of *Astragalus*, *Lepidium*, *Opuntia*, *Senecio*, *Erigeron*, *Haplopappus*, *Cryptantha*, *Eriogonum*, *Gilia*, and *Castilleja* were observed. These may be threatened or endangered plants, but due to the season of the survey, the species could not be identified. *Astragalus lentiginosus*, *Lepidium montanum*, and *Machaeranthera canescens* were also present, but due to the season, the variety could not be determined.

d. Vegetation: The vegetation in Cluster 5 varies from shadscale scrub in the lower elevations to sagebrush scrub at the higher elevations. Dominant shrub species include winterfat,

	Shelter Site Number																								Resitings					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	5	9	12	18(c)	19	20
Elevation (feet)	4665	4655	4660	4665	4640	4690	5060	4880	4831	4920	5100	5180	4810	4870	5040	4810	5120	5020	5120	5360	5360	5500	5785	4825	4640	4640	5160	5020	5140	5350
Soil Texture(a)																														
Coarse gravel										X														X					X	X
Fine gravel	X		X	X		X			X	X	X	X											X			X	X			
Coarse sand	X			X		1			X	X		X			X											X	X			
Fine sand	1	X	X	1					1	1	X	1			1									X		1	1			
Silt		1	1		1		1	1			1		1	1		1	1	1	1	1	1	1	1	1	1			1		
Clay																								X						
Rocks																													1	1
Disturbance(a)																														
Offroad vehicles	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	1	2	2	1	2	2	3	
Erosion																														1
Grazing	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1		1		1	1	1	2	1	1	2	1	2	1	2
Other (animal disturbance)																													2	
Overall Intensity of Disturbance(b)	L	L	L	H	M	L	M	M	L	L	L	L	M	M	L	M	M	M	M	L	M	M	M	M	L	L	L	M	L	M

(a) 1-Highest relative importance/impact; 2-lesser relative importance/impact; 3-lowest relative importance/impact.
X-Indicates presence
(b) H-High; M-Moderate; L-Low
(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN
CLUSTER 5
DRY LAKE VALLEY, NEVADA

TABLE 3-23

Gutierrezia, Mormon tea, Fallugia paradoxa, little sage, horsebrush, Prunus, rabbitbrush, four-wing saltbush, saltbush, and gray molly. Galleta grass is widespread and a dominant species in many areas. Other codominant perennial grass species in this cluster include Oryzopsis hymenoides and Sporobolus cryptandrus.

The perennial vegetative cover in Cluster 5 ranges from three to 30 percent and averages 20 percent.

Plant species observed in Cluster 5 are summarized in Table 3-24, and dominant associations are mapped in Figure 3-27.

e. Wildlife: Wildlife observations in Cluster 5 are summarized in Table 3-25. Characteristic burrows indicate the presence of gophers and kangaroo rats. Less characteristic mounds indicate the presence of additional unidentified burrowing species throughout the cluster. Mammal species, including domestic cattle, wild horses, coyotes, kit foxes, badgers, and rabbits, were identified by scat found on the sites. A bighorn sheep curl found in Shelter Site 9 may indicate occasional use of the valley by this species.

Other common wildlife observed in the cluster included the side-blotched lizard, blacktailed jackrabbit, and horned lark. Less common birds and reptiles included ravens, crows, sage sparrows, loggerhead shrikes, desert horned lizards, and sagebrush lizards.

	Shelter Site																								Resitings					
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	5	9	12	18(a)	19	20
AGAVACEAE																														
Yucca baccata										X					X					X		X								X
ASTERACEAE (COMPOSITAE)																														
Ambrosia acanthicarpa				X						X																				
Ambrosia eriocentra									X																	X				
Artemisia nova																				X	X	X							X	X
Artemisia spinescens		X	X							X											X									
Artemisia tridentata							X	X	X		X	X			X		X		X				X			X	X		X	X
Aster sp.																	X													
Chaenactis sp.															X	X														
Chrysothamnus greenei	X		X																											
Chrysothamnus nauseosus										X		X															X			
Chrysothamnus viscidiflorus						X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X		X	X	X	X	X
Erigeron sp.																	X													
Gutierrezia microcephala						X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X		
Gutierrezia sarothrae	X								X										X					X		X			X	X
Haplopappus	X																													
Machaeranthera canescens		X	X			X								X		X	X	X	X									X		
Machaeranthera grindelioides var. depressa																							X							
Senecio sp.																			X	X			X							
Tetradymia axillaris	X					X														X			X	X						X
Tetradymia glabrata	X	X	X				X	X	X	X	X	X		X	X	X	X		X		X	X							X	X
Tetradymia spinosa						X	X																							
Viguiera multiflora								X	X	X	X	X			X			X	X	X	X		X					X	X	X
BORAGINACEAE																														
Cryptantha sp.																		X										X		
Lappula occidentalis							X									X														

(a) Surveyed but not resited.

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 5 SITES
DRY LAKE VALLEY, NEVADA

PAGE 1 OF 4 TABLE 3.24

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings 5	9	12	18	19	20
BRASSICACEAE (CRUCIFERAE)																														
Caulanthus pilosus									X	X	X											X	X			X				X
Caulanthus crassicaulis																							X							
Descurainia pinnata	X	X	X		X																									
Descurainia sp.							X		X	X															X	X			X	
Lepidium montanum	X	X																											X	
Lepidium sp.																X														
Stanleya pinnata							X																							
Streptanthus cordatus																	X				X									
CACTACEAE																														
Coryphantha vivipara																		X										X		
Echinocereus engelmannii															X					X			X							
Opuntia echinocarpa							X		X	X	X		X	X	X		X	X	X	X	X			X		X		X	X	
Opuntia erinacea		X				X	X			X		X		X		X						X					X		X	
Opuntia sp.									X								X	X	X					X		X		X		
CHENOPODIACEAE																														
Atriplex canescens	X				X		X			X	X	X	X	X	X	X		X	X		X	X			X		X	X	X	X
Atriplex confertifolia	X	X	X		X																									
Ceratoides lanata	X	X	X	X	X	X		X	X	X		X	X	X		X	X	X	X	X	X			X	X	X	X	X	X	X
Grayia spinosa							X																						X	X
Salsola iberica				X	X									X				X			X							X		X
Suaeda torreyana		X	X																											
CUPRESSACEAE																														
Juniperus osteosperma										X											X	X	X							
EPHEDRACEAE																														
Ephedra nevadensis							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 5 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-24

Species	Shelter Site																								Resitings					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	5	9	12	18	19	20
EUPHORBIACEAE																														
Euphorbia sp.	X																	X										X		
FABIACEAE																														
Astragalus lentiginosus																	X						X							
Astragalus sp.																		X		X								X		
LAMIACEAE																														
Salvia carnosa	X																													
Salvia dorrii							X																							
LINACEAE																														
Linum perenne																					X									
MALVACEAE																														
Sphaeralcea ambigua		X	X						X			X	X		X	X	X		X		X			X					X	X
Sphaeralcea grossulariifolia																		X										X		
POACEAE (GRAMINAE)																														
Aristida purpurea												X		X	X		X	X	X	X	X	X	X				X	X	X	X
Aristida sp.										X																				
Bouteloua gracilis																			X	X										
Bromus rubens					X				X	X	X					X										X				
Bromus tectorum					X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X
Erioneuron pulchellum						X				X		X			X												X			
Hilaria jamesii	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X		X	X	X	X	X
Muhlenbergia cooperi	X																													
Oryzopsis hymenoides	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X	X
Sitanion hystrix	X	X	X			X		X	X	X			X	X	X		X	X	X		X	X	X	X				X	X	X

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 5 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-24

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings 5	9	12	18	19	20
POACEAE (GRAMINAE) (Cont.)																														
Sporobolus airoides														X																
Sporobolus contractus																									X				X	
Sporobolus cryptandrus						X					X	X	X	X	X	X	X	X	X					X				X	X	X
Stipa comata																						X	X							X
Stipa sp.																					X	X								
Vulpia octoflora																		X										X		
POLEMONIACEAE																														
Gilia sp.							X										X													
Langosia sp.																X	X	X	X									X		
POLYGONACEAE																														
Eriogonum deflexum			X			X			X	X																X				
Eriogonum inflatum																		X										X		
Eriogonum sp.					X			X						X		X	X	X	X									X		
Oxytheca perfoliata																X														
RANUNCULACEAE																														
Delphinium sp.							X						X																	
ROSACEAE																														
Cowania mexicana									X	X	X										X		X			X				
Fallugia paradoxa															X			X										X		
Prunus fasciculata								X	X									X			X	X	X					X		X
SCROPHULARIACEAE																														
Castilleja sp.																					X									
Penstemon palmeri										X																				
Mimulus sp.										X																				
SOLANACEAE																														
Lycium andersonii							X	X	X	X	X	X	X		X		X	X	X	X		X	X	X				X		

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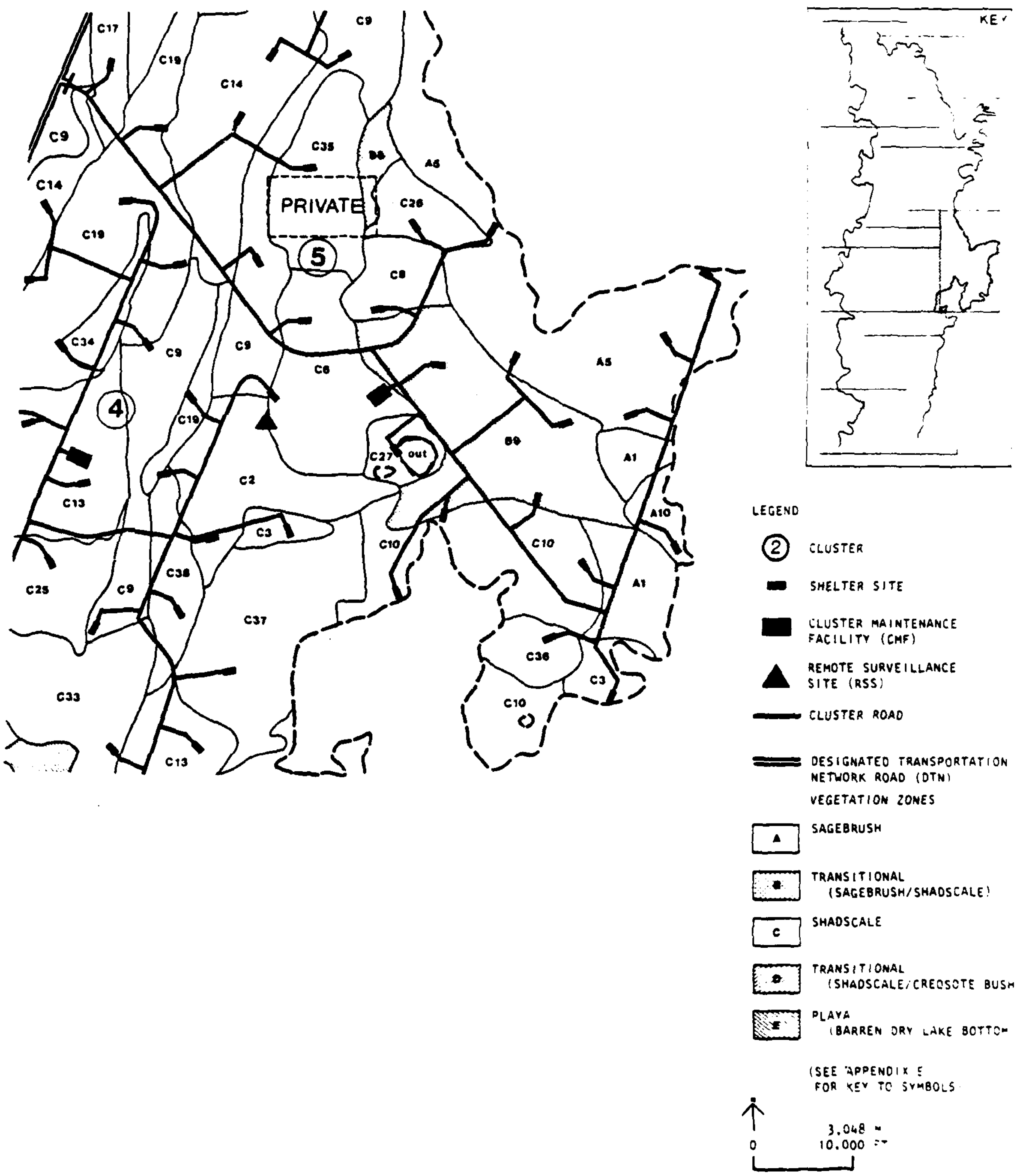
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 5 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-24



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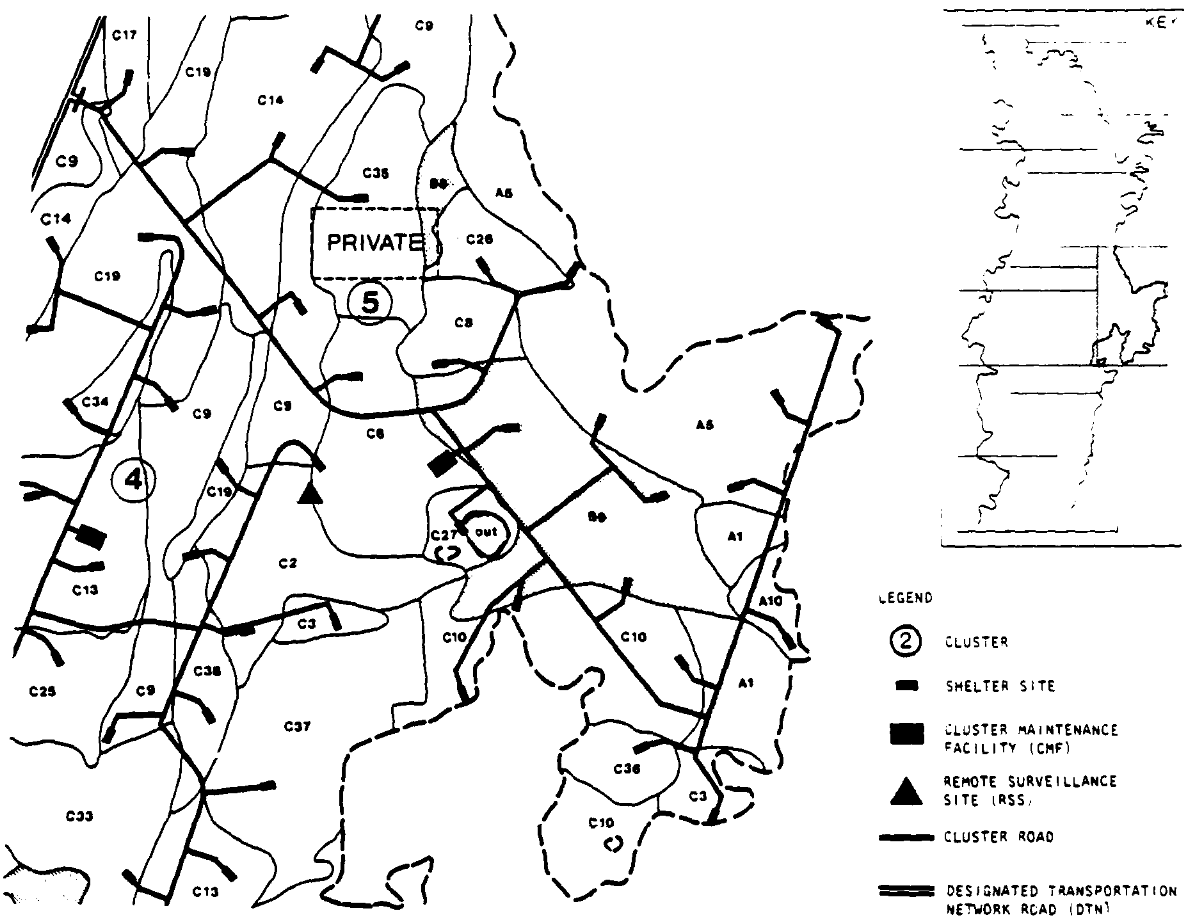
DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 5

FIGURE 3-27



LEGEND

2 CLUSTER

SHELTER SITE

CLUSTER MAINTENANCE FACILITY (CMF)

REMOTE SURVEILLANCE SITE (RSS)

CLUSTER ROAD

DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)

VEGETATION ZONES

A SAGEBRUSH

B TRANSITIONAL (SAGEBRUSH/SHADSCALE)

C SHADSCALE

D TRANSITIONAL (SHADSCALE/CREOSOTE BUSH)

E PLAYA BARREN DRY LAKE BOTTOM

SEE APPENDIX F FOR KEY TO SYMBOLS

0 3,048 M
10,000 FT

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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 5

FIGURE 3-27

Species	Shelter Sites 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings 5	9	12	18(a)	19	20
Mammals																														
Cattle (sign)	X	X			X													X										X		
Horse (sign)	X		X			X																X	X							
Big horn sheep (sign)									X																	X				
Coyote (sign)	X	X	X		X				X				X							X						X				X
Kitfox (sign)			X																					X						
Badger (sign)							X	X			X																			
Blacktail jackrabbit	1	2					3	1		10	4	1			1			2						3			1	2		
Rabbit (sign)	X	X		X	X	X	X	X	X		X	X		X			X		X	X	X	X	X	X	X	X	X		X	X
Mammal burrow (active)	X	X	X		X	X		X	X		X	X	X	X	X			X	X					X		X	X	X	X	
Mammal burrow (inactive)	X	X	X	X	X	X			X			X	X											X		X	X			
Unidentified large burrow																X	X		X		X									
Kangaroo rat burrow (active)				X		X													X	X									X	X
Gopher burrow (active)				X															X	X				X					X	X
Squirrel (sign)																													X	
Mouse (sign)																														X
Birds																														
Horned lark	P	P	P	P	P	P		P	P					P	P	P	P			P				P	P	P				
Raven		1				1																		P						
Crow															10															
Sage sparrow								1				1															1			
Loggerhead shrike		1																												
Unidentified large nest																				1										
Reptiles																														
Side-blotched lizard		12	14	2		7		3	9	6	5			5	4			1		3	17	4	4	5				1		2
Desert horned lizard	1																													
Sagebrush lizard					1	5				1							3													

number - actual sightings.
P - present but not counted.
X - sign observed.
(a) Surveyed but not relocated.

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SUMMARY 5 WILDLIFE OBSERVED IN
CLUSTER 5 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-25

3.2.5.6 Summary of Conditions in Cluster 6

a. Abiotic Conditions: The legal descriptions for Cluster 6 are given in Appendix F. Elevations range from 4705 to 5270 feet (1448 to 1622 m), and all sites are located on slopes of approximately 3 degrees. The soil is alluvial. Sites 1 through 10 are composed of gravel and fine and coarse sand. Silt intermixed with sand and gravel was the major substrate on Sites 11 through 23. Abiotic conditions within Cluster 6 are summarized in Table 3-26.

b. Disturbance: Disturbance was low to moderate at all sites. Grazing is the primary source of disturbance, and off-road vehicles a secondary source on all sites except Sites 8, 19, and 21. On these sites, off-road vehicle damage is greater than grazing damage. *Salsola iberica* and *Halogeton glomeratus* are present only on Sites 11 and 13, respectively.

c Threatened or Endangered Plant Species: Individuals of *Coryphantha vivipara* were observed on Sites 1 and 14. This species is listed as a Taxon Currently Under Review in the 1980 Federal Register. As described previously, it is a Category 2 plant. Individuals of *Lupinus*, *Castilleja*, *Mentzelia*, *Gilia*, *Camissonia*, *Haplopappus*, *Senecid*, *Eriogonum*, and *Astragalus* were also observed. These may be threatened or endangered plants, but due to the season of the survey, it was not possible to determine the species. *Machaeranthera canescens*, *Gutierrezia sarothrae*, *Lepidium montanum*, and *Astragalus lentiginosus* were also observed, but the variety could not be determined due to the season.

Factor	Original Sites 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings 1	1 (c)	1 (c)	2	14 (c)	18
Elevation (feet)	5195	5030	4870	4840	5005	4930	5270	4785	4875	4880	4870	4760	4705	4800	4840	4940	[illegible]	4900	5015	4960	4850	4890	4960	4840	5185	5200	5165	5030	4780	4885
Soil Texture[a]																														
. course gravel		X														X	X	X	X					X	X	X	1	1		
. fine gravel	X	X	X	X	X	X	X	X	X	X	X				X			X					X		X	X	X	X		
. coarse sand	X	X	X		X	X	X	X	X	X	X		X			X	X	X							X	X	X	X		
. fine sand	1	1	1	1	1	1	1	1	1	1			X		X	1	1		X					X	X	X				
. silt											1	1	1	1	1		4	1	1	1	1	1	1	1?	1	1				
. clay																								1?	X	X				
Disturbance[a]																														
. offroad vehicles	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	–	–			2	2
. mining/const.																														
. erosion																											2			
. grazing	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	–	–		1	1	1
. other (rabbits)																											1	2		
Overall Intensity of Disturbance[b]	L	M	L	L	L	L	L	L	L	L	L	M	L	L	L	L	M	L	L	M	M	M	M	L	L	L	M	M		

(a) 1 - Highest relative importance/impact; 2 - lesser relative importance/impact; 3 - least relative importance/impact; X - Indicates presence.

(b) H - High; M - Moderate; L - Low.

(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN CLUSTER 6 SITES DRY LAKE VALLEY, NEVADA

TABLE 3-26

d. Vegetation: The vegetative community is composed of mixed shrub associations characteristic of the shadscale and sagebrush zone. Dominant shrubs throughout this area include winterfat, hop sage, Mormon tea, big sagebrush, *Lycium*, horsebrush, rabbitbrush, *Guterrezia*, gray molly, four-wing saltbush, and *Acamptopappus shocklei*. *A. shocklei* has a wide distribution in the Mojave desert and often is a dominant species in the community. The presence of this species is unusual and supports the idea that Dry Lake Valley is a transitional area having both Great Basin and Mojave Desert characteristics. *Ambrosia eriocentra* is a dominant shrub in washes. Galleta grass is a dominant species on several study sites.

The perennial vegetative cover in Cluster 6 ranges from 14 to 34 percent and averages 24 percent. Plant species observed in Cluster 6 are summarized in Table 3-27, and distribution of dominant associations is mapped in Figure 3-28.

e. Wildlife: Wildlife observations in Cluster 6 are summarized in Table 3-28. Characteristic burrows indicate the presence of kit fox and antelope ground squirrel. Less characteristic mounds indicate the presence of additional unidentified burrowing species. The presence of cattle, horses, rabbits, and badgers was determined through scat identification. Common species observed in the cluster included the blacktail jackrabbit, desert cottontail, horned lark, and side-blotched lizard. Less common species observed included the golden eagle, kangaroo rat, raven, sage sparrow, sage trasher, crow, desert

Species	Original Sites																								Resitings					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	1 (Opt.1)	1(a) (Opt.2)	1(a) (Opt.3)	2	14(a)	18
AGAVACEAE																														
Yucca baccata					X		X								X		X		X											
ASTERACEAE (Compositae)																														
Ambrosia acanthicarpa									X																					
Ambrosia eriocentra		X	X																							X				
Artemisia nova																			X											
Artemisia spinescens	X	X			X	X	X	X	X	X		X	X	X	X			X	X		X	X		X				X	X	X
Artemisia tridentata	X	X	X		X	X	X		X	X	X				X	X	X	X	X					X	X	X	X	X		X
Chrysothamnus greenei				X				X				X		X	X								X					X		
Chrysothamnus viscidiflorus	X	X	X		X	X	X	X	X							X	X	X	X	X		X	X		X	X	X	X		X
Gutierrezia microcephala	X	X	X			X			X	X								X							X	X			X	X
Gutierrezia sarothrae					X						X																X	X		
Hymenoclea salsola			X		X	X				X					X	X				X	X		X							
Tetradymia axillaris	X	X	X		X		X			X	X			X		X		X	X				X		X		X	X	X	
Tetradymia glabrata	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X	X	X	X		X	X	X		X	X	X	X
Acamptopappus shockleyi																													X	
Acamptopappus sp.											X																			
Dyssodia papposa		X	X			X	X	X							X			X												
Haplopappus sp.		X																												
Machaeranthera canescens	X	X					X	X	X							X														X
Senecio sp.																				X										
Stephanomeria sp.																					X									
Viguiera multiflora		X									X										X					X				
BORAGINACEAE																														
Lappula occidentalis																						X								

(a) Surveyed but not relocated.

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 6 SITES
DRY LAKE VALLEY, NEVADA

PAGE 1 OF 4 TABLE 3-27

	Original Sites																							Resitings						
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	1 (Opt.1)	1 (Opt.2)	1 (Opt.3)	2	14	18
BRASSICACEAE (Cruciferae)																														
Caulanthus pilosus	X								X								X				X	X	X							
Descurainia sp.	X		X		X		X		X																					
Descurainia pinnata											X		X		X	X		X												
Lepidium montanum									X				X			X														
Stanleya pinnata							X																					X		
CACTACEAE																														
Coryphantha vivipara														X																
Echinocereus engelmannii							X																							
Opuntia echinocarpa		X			X	X	X		X	X	X			X	X	X			X					X	X		X	X	X	X
Opuntia erinacea	X		X		X			X	X	X		X	X		X	X	X				X	X		X		X	X	X	X	X
CAPRIFOLIACAEA																														
Symphoricarpos sp.	X																	X												
CHENOPODIACEAE																														
Atriplex canescens	X	X	X		X		X	X	X		X	X		X	X	X		X		X		X	X		X				X	X
Atriplex confertifolia													X								X	X								
Ceratoides lanata		X	X	X	X			X	X		X	X		X							X	X	X					X	X	X
Grayia spinosa	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X			X	X	X		X	X	X	X
Halogeton glomeratus													X																	
Kochia americana													X								X									
Salsola iberica														X															X	
EPHEDRACEAE																														
Ephedra nevadensis	X	X	X		X	X	X		X	X	X	X		X	X	X	X	X	X	X				X	X	X	X	X	X	X
EUPHORBIACEAE																														
Euphorbia sp.	X	X																												
FABIACEAE (LEGUMINOSAE)																														
Astragalus lentiginosus	X	X			X	X	X	X	X										X						X	X	X	X		X
Astragalus sp.	X				X	X								X	X	X	X				X		X							
Lupinus sp.	X																													
LAMIACEAE																														
Salvia dorrii											X																		X	

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 6 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-27

Species	Original Sites																								Resitings					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	1 (Opt.1)	1 (Opt.2)	1 (Opt.3)	2	14	18
LOASACEAE																														
Mentzelia sp.																					X									
MALVACEAE																														
Sphaeralcea ambigua		X			X	X	X	X	X		X	X	X	X				X			X	X						X		X
ONAGRACEAE																														
Camissonia sp.	X																													
POACEAE (GRAMINAE)																														
Aristida purpurea					X				X	X										X	X									
Aristida sp.																								X					X	
Bromus rubens											X							X												
Bromus tectorum	X	X	X			X	X	X	X				X		X	X		X	X	X		X				X	X	X		X
Erioneuron pulchellum		X			X	X	X		X							X	X	X											X	
Hilaria jamesii		X		X	X	X	X		X	X	X	X			X	X	X	X		X	X		X	X		X	X	X	X	X
Muhlenbergia porteri		X			X	X	X	X		X	X			X		X			X	X								X	X	
Oryzopsis hymenoides	X	X	X		X	X	X		X		X	X	X	X	X	X		X			X	X	X	X			X		X	X
Sitanion hystrix	X	X	X		X	X	X		X	X	X	X	X	X	X		X	X		X	X	X	X	X		X	X	X	X	X
Sporobolus contractus		X	X					X										X										X		
Sporobolus cryptandrus																					X	X								
Sporobolus flexuosus			X																											
POLEMONIACEAE																														
Gilia sp.																				X	X									
POLYGONACEAE																														
Eriogonum deflexum		X	X										X			X		X												
Eriogonum enceliopsis		X				X																								
Eriogonum inflatum											X																			
Eriogonum nidularium					X	X			X									X					X							
Eriogonum sp.																										X				
Oxytheca perfoliata										X	X																			

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 6 SITES
DRY LAKE VALLEY, NEVADA

PAGE 3 OF 4 TABLE 3-27

	Original Sites																								Resitings					
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	1 (Opt.1)	1 (Opt.2)	1 (Opt.3)	2	14	18
ROSACEAE																														
Cowania mexicana	X										X						X		X						X	X				
Prunus fasciculata																	X													
SCROPHULARIACEAE																														
Castilleja sp.														X																
Mimulus sp.																										X				
SOLANACEAE																														
Lycium andersonii	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X				X	X	X		X	X	X

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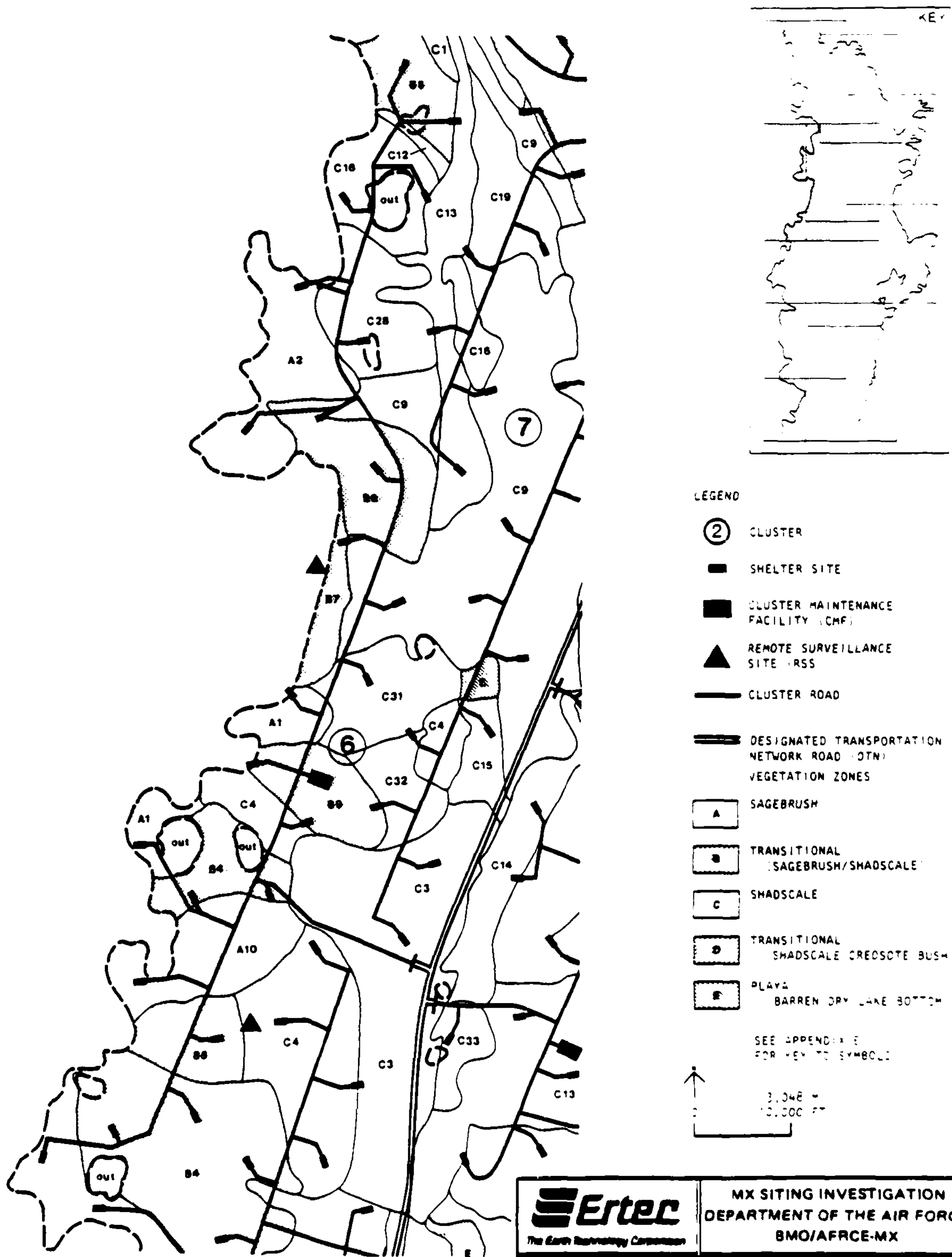
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 6 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-27



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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 6

FIGURE 3-28

Species	Shelter Sites 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resitings Opt 1	Opt 2(a)	Opt 3(a)	2	14(a)	18
Mammals																														
Horse (sign)	X	X	X	X	X	X					X		X	X	X	X	X	X	X	X							X	X	X	X
Coyote (sign)	X	X		X		X		X	X				X	X	X	X	X	X	X	X	X	X	X	X			X	X		X
Kit fox den (active)				X																										
Kit fox den (inactive)		X	X													X			X									X		
Rabbit (sign)	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Kangaroo rat (sign)	X	X		X	X	X																					X	X		
Blacktail jackrabbit	7	6	5	9	3	1	2		2	6			4	18	16			3	5	13	1		8	6	1	1	2	1	2	6
Desert cottontail	3	1		1	2				1	3				2	4	1		2								1	1	1		1
Antelope ground squirrel			1																	1										
Badger (sign)	X																									X				
Rodent burrow (active)	3																							X	1		X	X		
Gopher (sign)	X	X																									2	1		
Mammal burrow (active)																								X		X			X	X
Mammal burrow (nactive)																								X		X	X		X	
Birds																														
Horned lark		P										P	P	P	P				P	P	P	P	P	P				13	P	
Raven								2														1								
Golden eagle								1		1																				
Sage sparrow		1	1	1	1				1	1						1				2			1							
Sage thrasher				1																3										
Crow												2																		
Reptiles																														
Side-blotched lizard	2	5	11	16	6	26	7	8	3	1	6	8	3	9	2	6	5	14		16	6	12	30	5					3	
Desert horned lizard																	1													
Sagebrush lizard						1	2	1									1		1											
Long-nosed leopard lizard								1				1																		
Great Basin rattlesnake							1					1																		
Striped whipsnake													1																	

Number - actual sightings.
P - present but not counted.
X - sign observed.
(a) Surveyed but not relocated.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 6 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-28

horned lizard, sagebrush lizard, long-nosed leopard lizard, and Great Basin rattlesnake.

3.2.5.7 Summary of Conditions in Cluster 7

a. Abiotic Conditions: The legal descriptions for Cluster 7 are given in Appendix F. Elevations range from 4645 to 4880 feet (1405 to 1502 m), and survey areas are located on slopes of 3 degrees or less. The soil is alluvial, composed mainly of silt and fine and coarse sand intermixed with some fine and coarse gravel. Abiotic conditions within the cluster are summarized in Table 3-29.

b. Disturbance: Sites 1, 4, and 5 are highly disturbed and other sites range from low to moderately disturbed. Grazing is the primary source of disturbance, followed by off-road vehicle usage as a secondary source on all sites except Site 2. On this site, off-road vehicles caused greater impact than grazing. *Salsola iberica* was present on Sites 4, 5 and 15 and *Halogeton glomeratus* on Site 4.

c. Threatened or Endangered Plants: No threatened, endangered, or sensitive species of plants were observed within Cluster 7 during the field survey. Individuals of *Eriogonum*, *Astragalus*, and *Penstemon* were observed, but due to the season of the survey, the species could not be identified. *Astragalus lentiginosus*, *Gutierrezia sarothrae*, *Lepidium montanum*, and *Machaeranthera canescens* were also present, but due to the season, the variety could not be determined.

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF
	Site Number																							
Elevation (feet)	4645	4660	4735	4730	4660	4680	4700	4725	4715	4740	4770	—	4790	4820	4810	4860	4880	4848	4820	4825	4800	4765	4750	4755
Soil Texture(a)																								
. course gravel		X											X		X							X		X
. fine gravel		X											X											X
. coarse sand		1				X		X	X		X			X	X			X	X		X	X		
. fine sand					X	1	X	1	1		1		X	X		X	X	X	X	X	X	1		X
silt	1		1	1	1		1			1		1	1	1	1	1	1	1	1	1	1		1	
Disturbance(a)																								
. offroad vehicles	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	2
. mining/const.																								
. erosion																								
. grazing	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Overall Intensity of Disturbance(b)	H	M	M	H	H	L	L	L	M	M	L	M	L	L	M	M	L	L	L	L	M	L	L	L

(a) 1 - Highest relative importance/impact; 2 - lesser relative importance/impact; 3 - least relative importance/impact .
X - Indicates presence.

(b) H - High; M - Moderate; L - Low.

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SUMMARY OF ABIOTIC FACTORS IN
CLUSTER 7 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-29

d. Vegetation: The vegetative community is a shadscale/mixed shrub association. Dominant shrubs throughout the cluster include fourwing saltbush, rabbitbrush, winterfat, hop sage, Gutierrezia, Mormon tea, horsebrush, gray molly, bud sage, Lycium, and shadscale. Galleta grass and Sitanion hystrix were codominants with the shrub species in several of the sites.

The perennial vegetative cover in Cluster 7 ranges from 10 to 32 percent and averages 22 percent. Plant species observed in Cluster 7 are summarized in Table 3-30, and distribution of dominant associations is mapped in Figure 3-29.

e. Wildlife: Wildlife observations in Cluster 7 are summarized in Table 3-31. Characteristic burrows indicate presence of kitfox and antelope ground squirrel. Less characteristic mounds indicate the presence of additional unidentified burrowing species throughout the cluster. The occasional presence of coyotes, horses, and rabbits was determined by identification of scat. Common wildlife sighted included the side-blotched lizard, horned lark, and blacktailed jackrabbit. Ravens, desert horned lizards, and Great Basin fence lizards were observed less frequently.

3.2.5.8 Summary of Conditions in Cluster 8

a. Abiotic Conditions: The legal descriptions for Cluster 8 are given in Appendix F. Elevations range from 4673 to 5850 feet (1437 to 1800 m), and all survey areas are located on slopes of approximately 3 degrees. The soil is alluvial, composed of silty clay or silty sand, and gravel is scattered on

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF
ASTERACEAE (Compositae)																								
Ambrosia eriocentra				X																				
Artemisia spinescens	X		X	X							X	X			X		X	X	X	X	X	X	X	
Artemisia tridentata											X						X							
Chrysothamnus nauseosus											X								X					
Chrysothamnus viscidiflorus	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X		X		X
Chrysothamnus greenii	X																							
Gutierrezia sarothrae			X			X	X	X		X	X			X			X				X			X
Psathyrotes annua		X																						
Tetradymia axillaris			X							X		X			X			X	X			X		
Tetradymia spinosa	X	X					X			X	X	X							X			X		X
Tetradymia glabrata	X	X	X			X	X	X	X	X	X	X	X		X		X	X	X	X	X	X		X
Acamptopappus sp.	X	X				X		X	X		X		X	X										
Machaeranthera canescens	X	X		X		X	X	X	X	X	X	X	X	X	X		X	X	X	X		X		X
Viguiera multiflora											X						X						X	
BORAGINACEAE																								
Lappula occidentalis																								X
BRASSICACEAE (Cruciferae)																								
Descurainia sp.	X						X	X		X		X			X				X	X	X	X		X
Lepidium montanum	X	X				X	X	X			X									X		X		X
Stanleya pinnata	X	X				X	X	X	X		X													
CACTACEAE																								
Opuntia erinacea			X	X			X					X			X			X	X	X	X		X	X
Opuntia echinocarpa																	X							

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 7 SITES
DRY LAKE VALLEY, NEVADA

PAGE 1 OF 3 TABLE 3-30

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FIELD SURVEYS, IOC VALLEYS. BIOLOGICAL RESOURCES SURVEY, DRY LA--ETC(U)
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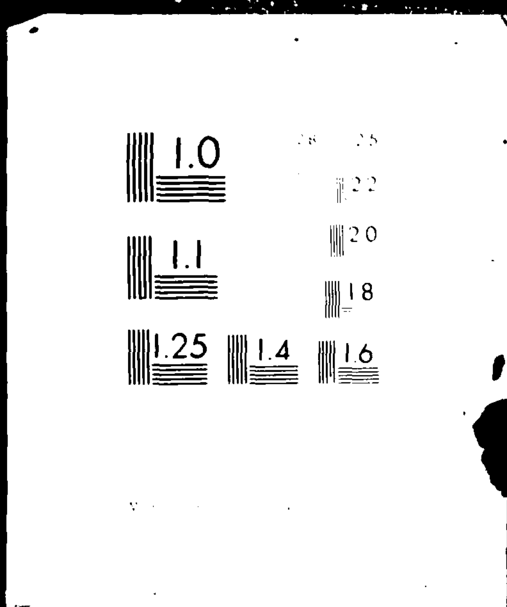

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF
	Site Numbers																							
CHENOPODIACEAE																								
Atriplex canescens	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X		X
Atriplex confertifolia	X	X	X		X		X	X		X	X	X		X					X	X	X	X	X	X
Ceratoides lanata	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X
Grayia spinosa			X	X											X		X	X	X	X		X		
Suaeda torreyana	X				X		X		X		X	X		X					X	X	X	X	X	
Halogeton glomeratus				X																				
Salsola iberica				X	X										X									
Suaeda fruticosa					X																			
EPHEDRACEAE																								
Ephedra nevadensis		X	X							X	X	X	X									X		X
EUPHORBIACEAE																								
Euphorbia sp.		X				X		X	X	X	X			X										
FABIACEAE (Leguminosae)																								
Astragalus lentiginosus		X	X			X									X		X							X
Astragalus sp.										X														
MALVACEAE																								
Sphaeralcea ambigua		X	X	X		X		X	X		X	X	X		X		X	X	X	X	X	X	X	
POACEAE (Graminae)																								
Agropyron sp.														X										
Bromus tectorum	X		X	X	X	X						X		X	X		X	X	X	X			X	
Hilaria jamesii	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X			X
Oryzopsis hymenoides	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Sitanion hystrix	X	X	X	X	X		X				X	X	X	X			X	X	X	X	X	X	X	X
Sporobolus contractus																	X							
Sporobolus cryptandrus				X																				
Sporobolus sp.	X																							
Stipa comata													X		X									

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 7 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-30

Species	Shelter Site																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP
POLEMONIACEAE																								
Gilia contracta						X			X				X	X										
POLYGONACEAE																								
Eriogonum brachypodum																								X
Eriogonum deflexum	X	X		X	X		X	X	X	X	X	X	X	X			X		X			X		
Eriogonum nidularium																		X						
Eriogonum sp.																								
SCROPHULARIACEAE																								
Penstemon sp.		X				X		X	X	X	X		X	X								X		X
SOLANACEAE																								
Lycium andersonii			X														X	X						

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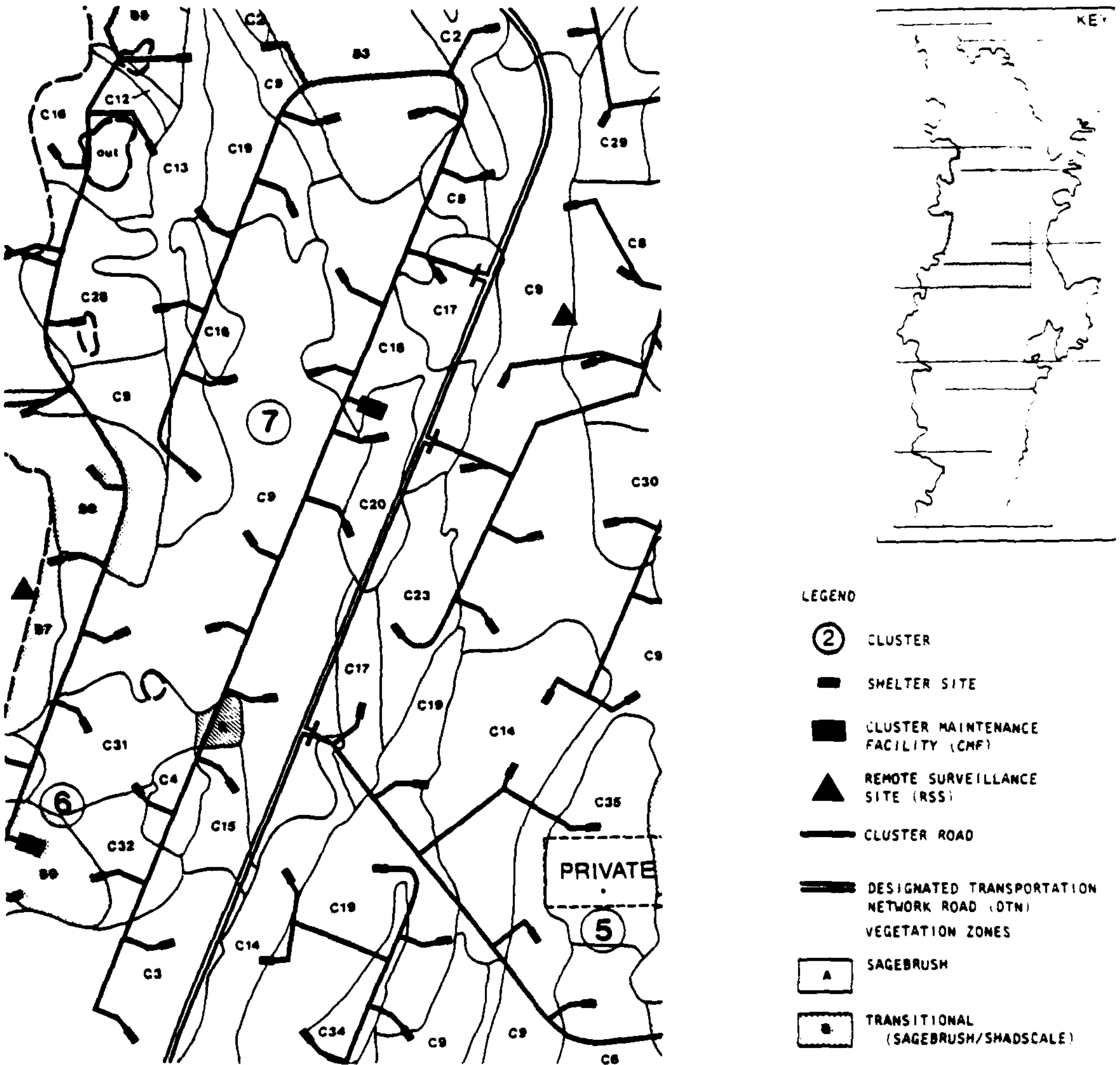
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 7 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-30



LEGEND

② CLUSTER

SHELTER SITE

CLUSTER MAINTENANCE FACILITY (CMF)

REMOTE SURVEILLANCE SITE (RSS)

CLUSTER ROAD

DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)

VEGETATION ZONES

A SAGEBRUSH

B TRANSITIONAL (SAGEBRUSH/SHADSCALE)

C SHADSCALE

TRANSITIONAL (SHADSCALE/CREOSOTE BUSH)

PLAYA (BARREN DRY LAKE BOTTOM)

SEE APPENDIX E FOR KEY TO SYMBOLS

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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 7

FIGURE 3-29

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF
												Site Number												
Mammals																								
Horse (sign)		X					X										X	X	X	X	X	X	X	
Coyote (sign)	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X			X
Kitfox den (inactive)															X									
Blacktailed jackrabbit	1			2	1			1	2	2	1	3		2	2	1		11	3	3		3		5
Rabbit (sign)	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Kangaroo rat (sign)		X																						
Ground squirrel burrow (active)							X							X			X	X	X		X	X		X
Ground squirrel burrow (inactive)						X						X		X		X		X	X	X		X	X	X
Mammal burrows (inactive)	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Mammal burrows (active)																								X
Birds																								
Horned lark	P	P	P	P	P		P	P	P		P	P	P	P	P	P	P	P	P	P	P	P		P
Raven														P				P						
Reptiles																								
Side-blotched lizard			2	16		1		1	1	6		2		1	9	2		5		1	3	4		2
Desert horned lizard										1											1	1		
Great Basin fence lizard						6														1	4			

Number - Actual sightings.
P - Present but not counted.
X - Sign observed.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 7 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-31

the ground surface throughout the cluster. Abiotic conditions within the cluster are summarized in Table 3-32.

b. Disturbance: Grazing is the primary source of disturbance and off-road vehicle usage a secondary source on the majority of sites. Off-road vehicles have caused the primary disturbance on Sites 1, 19, 20, and 22, and erosion is the primary disturbance on Site 9. Disturbance is considered low to moderate on all sites except Sites 8 and 15 where it is considered high. Salsola iberica is present on seven sites, and Halogeton glomeratus is present on two sites.

c. Threatened or Endangered Plant Species: Four individuals of Coryphantha vivipara were observed on Site 19 and one individual on Site 22. This species is listed in the 1980 Federal Register as a Taxon Currently Under Review. It is a Category 2 plant as discussed previously.

Individuals of Astragalus, Senecio, Opuntia, Gilia, Mentzelia, Haplopappus, Cryptantha, Mammilaria, Gutierrezia, Eriogonum, Penstemon, and Sphaeralcea are also present, but species could not be identified due to the season of the survey. Lipidium montanum, Gutierrezia sarothrae, and Machaeranthera canescens were also observed, but the variety could not be determined due to the season.

d. Vegetation: The vegetation varies from shadscale scrub at the lower elevations to sagebrush scrub at the higher elevations. Dominant shrub species include winterfat, shadscale,

Factor	Original Sites																							Resitings						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS4	CMP (c)	18	19 (c)	21	22 (c)
Elevation (feet)	4680	4690	4673	4680	4710	4740	—	—	4750	4860	4780	5010	4850	5010	4810	5260	5320	5600	5850	—	5180	—	5540	4955	4775	4925	5600	5850	5170	5370
Soil Texture[a]																														
. course gravel						X		X		X	X	X	X	X		X	X	X		X	X	X	X				X	1	X	X
. fine gravel										X									X											
. coarse sand																												X		
. fine sand	1		X	X	1		X		X	X	X	X	X	X						X	X	X	X	X	X	X			1	X
. silt		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		X	1
. clay				X		X	X		X		X	X	X	X						X	X	X								X
Disturbance[a]																														
. offroad vehicles	1	2	2	2	2			2	2	2		2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	2	2	2	1
. mining/const.																														
. erosion							2		1																			3	3	
. grazing		1	1	1	1	1	1	1											2		1		1	1	1	1		1	1	
Overall Intensity of Disturbance[b]	M	M	M	M	M	L	L	H	L	M	L	L	M	L	H	L	L	L	L	L	L	L	L	M	M	M	L	L	L	L

(a) 1 - Highest relative importance/impact; 2 - lesser relative importance/impact; 3 - least relative importance/impact.
X - Indicates presence.
(b) H - High; M - Moderate; L - Low.
(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN
CLUSTER 8 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-32

wing saltbush, rabbitbrush, Gueterrezia, Lycium, bud sage, Mormon tea, and big sage. Big sage is the dominant species at the higher elevations, including Sites 15, 17, and 20 through 23. Galleta grass is sometimes a dominant species at lower elevations, such as at Site 8. Other perennial grass species in this transitional association include Indian rice grass and squirreltail grass.

The perennial vegetative cover in Cluster 8 ranges from 17 to 35 percent and averages 26 percent. Plant species observed in Cluster 8 are summarized in Table 3-33, and distribution of the dominant associations is mapped in Figure 3-30.

e. Wildlife: Wildlife observations in Cluster 8 are summarized in Table 3-34. Characteristic burrows indicate the presence of the antelope ground squirrel and kit fox. Less characteristic mounds indicate the presence of additional, unidentified burrowing species throughout the cluster. The occasional presence of cattle, horses, coyote, antelope, rabbit, and gopher was determined by scat identification, and the presence of the kangaroo rat was determined from tracks. Other common wildlife within the cluster included rabbits, horned larks, and side-blotched lizards. More than one-half of the sites showed evidence of horses, and mule deer scat was also evident in three sites. Three mule deer (a doe and two fawns) were observed on Site 8/16. Less commonly observed species include the sagebrush lizard, raven, vesper sparrow, loggerhead shrike, and western meadowlark. Raptors observed within the cluster include the American Kestrel, northern harrier, and Cooper's hawk.

Species	Original Sites 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS[4]	Resitings 18	19 (a)	21	22 (a)
AGAVACEAE																													
Yucca baccata												X				X		X					X				X	X	
ASTERACEAE (Compositae)																													
Ambrosia acanthicarpa						X																							
Artemisia sp.																				X									
Artemisia nova																								X		X			
Artemisia spinescens		X	X						X	X			X	X	X		X							X	X				
Artemisia tridentata									X			X	X	X		X	X	X	X		X	X	X			X	X	X	X
Chaenactis sp.						X		X					X																
Chrysothamnus sp.	X	X	X	X	X		X				X		X		X														
Chrysothamnus greenii						X																							
Chrysothamnus nauseosus																	X	X								X		X	
Chrysothamnus visidiflorus										X		X		X		X	X	X		X	X	X	X	X		X	X	X	X
Gutierrezia microcephala	X					X			X																			X	X
Gutierriezia sarothrae														X		X		X	X				X	X		X	X		
Gutierrezia sp.													X								X	X							
Haplopappus sp.																											X		
Hymenoclea salsola																	X	X					X						
Machaeranthera canescens		X	X		X			X				X			X								X		X	X			
Senecio sp.												X		X															
Tetradymia axillaris																X	X	X								X		X	
Tetradymia glabrata	X									X		X		X		X	X	X		X		X	X			X		X	
Tetradymia spinescens						X																		X					
Viguiera multiflora				X		X			X								X	X			X	X				X	X		
BORAGINACEAE																													
Cryptantha sp.																				X									
Lappula occidentalis				X	X		X	X	X	X	X			X	X							X	X						

(a) Surveyed but not relocated.

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PLANT SPECIES OBSERVED IN
CLUSTER 8 SITES
DRY VALLEY, NEVADA

PAGE 1 OF 4 TABLE 3-33

Species	Original Sites 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS[4]	Resitings 18	19	21	22
BRASSICACEAE (Cruciferae)																													
Caulanthus pilosus		X	X							X		X																	
Descurainia sp.							X																						
Lepidium montanum		X			X		X																						
Sisymbrium sp.									X	X						X													
Streptanthus cordatus														X								X							
CACTACEAE																													
Coryphantha vivipara																											X		
Echinocereus engelmannii																	X				X								
Mammalaria sp.																								X					
Opuntia erinacea						X		X										X					X			X	X		
Opuntia echinocarpa										X		X		X		X	X	X		X		X	X			X		X	
Opuntia sp.																								X					
CHENOPODIACEAE																													
Atriplex canescens	X	X		X	X	X	X	X			X			X	X	X				X				X		X	X	X	X
Atriplex confertifolia	X	X	X				X		X																X				
Ceratoides lanata		X	X	X	X	X	X	X	X	X	X		X	X	X		X							X	X				
Grayia spinosa										X		X		X		X	X					X		X		X	X	X	X
Halogeton glomeratus							X		X																				
Salsola iberica					X	X	X	X	X	X	X														X				
Suaeda torreyana			X																				X						
CUPRESSACEAE																													
Juniperus osteosperma																		X		X							X		
EPHEDRACEAE																													
Ephedra nevadensis						X				X		X				X	X	X	X	X	X	X	X	X		X	X	X	X
EUPHORBIACEAE																													
Euphorbia sp.	X																												

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PLANT SPECIES OBSERVED IN
CLUSTER 8 SITES
DRY LAKE VALLEY, NEVADA

PAGE 2 OF 4 TABLE 3-33

Species	Original Sites 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS[4]	Resitings 18	19	21	22
FABIACEAE (Leguminosae)																													
Astragalus sp.												X		X							X	X		X					
LAMIACEAE																													
Marrubium vulgare														X															
LOASACEAE																													
Mentzelia sp.				X									X		X														
MALVACEAE																													
Sphaeralcea sp.	X	X	X					X		X						X													
Sphaeralcea ambigua																											X		
ONAGRACEAE																													
Pinus monophylla																											X		
POACEAE (Graminae)																													
Aristida purpurea			X								X																		
Bromus tectorum				X		X	X		X	X		X		X				X		X	X	X	X	X	X	X	X	X	X
Erioneuron pulchellum										X				X		X								X					
Hilaria jamesii	X		X	X		X		X		X	X			X	X	X	X	X	X	X		X	X	X		X	X		X
Oryzopsis hymenoides	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X		X		X	X	X	X	X	X
Sitanion hystrix	X	X	X	X	X		X		X			X	X	X	X	X		X	X	X	X	X	X		X	X			
Sporobolus contractus										X							X	X					X						
Sporobolus cryptandrus						X		X		X			X		X			X						X					
Stipa comata																										X	X		X
Stipa sp.																			X	X									
Vulpia octoflora						X																							
POLEMONIACEAE																													
Gilia sp.	X											X																	

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PLANT SPECIES OBSERVED IN
LCUSTER 8 SITES
DRY LAKE VALLEY, NEVADA

PAGE 3 OF 4 TABLE 3-33

Species	Original Sites																								Resitings			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS[4]	18	19	21	22
POLYGONACEAE																													
<u>Eriogonum</u> sp.		X			X		X	X	X		X			X						X									
<u>Eriogonum nidularium</u>								X																					
<u>Eriogonum deflexum</u>																X													
RANUNCULACEA																													
<u>Delphinium</u> sp.																						X							
ROSACEAE																													
<u>Cowania mexicana</u>														X		X	X	X				X	X			X	X	X	X
<u>Prunus fasciculata</u>										X		X						X		X		X	X			X		X	
SCROPHULARIACEAE																													
<u>Mimulus</u> sp.																						X							X
<u>Penstemon</u> sp.	X										X						X	X											
SOLANACEAE																													
<u>Lycium andersonii</u>										X				X		X	X							X					X

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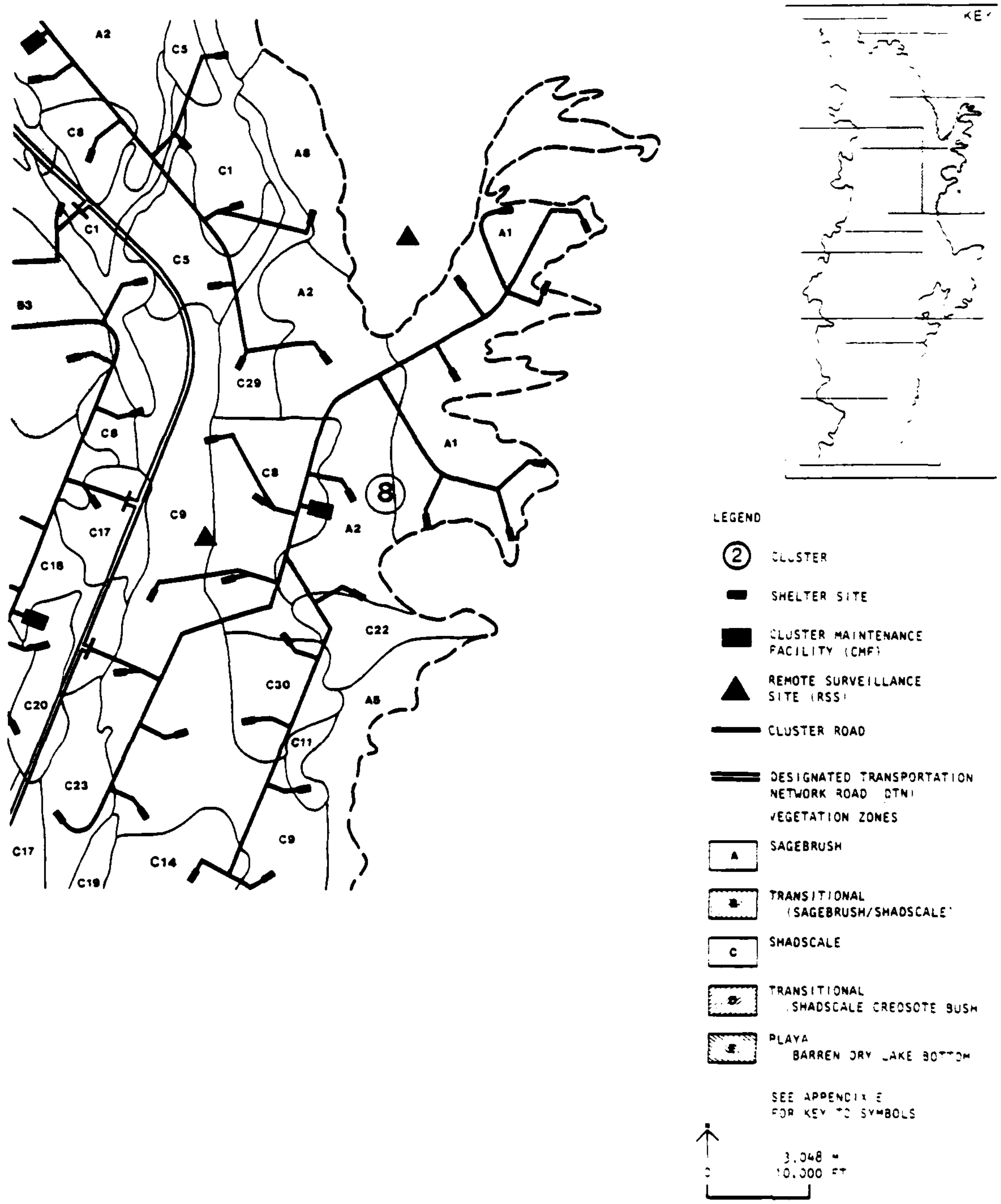
PLANT SPECIES OBSERVED IN
CLUSTER 8 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-33



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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 8

FIGURE 3-30

Species	Shelter Site																								Resitings			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS4	18	19 (a)	21	22 (a)
Mammals																													
Cow (sign)				X																									
Horse (sign)			X		X	X		X			X	X	X	X	X	X		X		X	X	X				X	X		
Muledeer (sign)																X		X			X					X			
Coyote (sign)	X	X			X	X	X		X	X	X	X			X			X		X	X	X	X	X	X	X			X
Antelope (sign)							X				X		X								X								
Kit fox den (active)										X																			
Kit fox den (inactive)							X		X										X								X		
Gopher (sign)												X						X								X			
Blacktailed jackrabbit	6	1	1		1		2		1	4		2	2	4	2		1			3	3	2	1	1					
Desert cottontail									1	7							1	1		2	2								
Rabbit (sign)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X				X		X	X	X	X
Antelope ground squirrel										X										X									
Mammal burrows	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X		X	
Kangaroo rat (sign)																		X								X			
Rodent burrows																										X			
Birds																													
Horned lark	P	P	P	P	P	P	P	P	P	P	P		P	P	P	P	P					P	P	P	P				
Raven							7		5								2	2											
Cooper's hawk																	1												
Western meadowlark					1											1													
Northern harrier				1																									
Loggerhead shrike												1																	
Vesper sparrow									2																				
Kestrel (off site)																					1			P				P	
Reptiles																													
Side-blotched lizard		5	15	3	7		1	15			9	8	15	30		7	5	7		13	13	9	3	21					
Sagebrush lizard												1								2	2								

(a) Surveyed but not relocated.
Number = Actual sightings; P = Present but not counted; X = Sign observed.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 8 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-34

3.2.5.9 Summary of Conditions in Cluster 9

a. Abiotic Conditions: The legal descriptions for Cluster 9 are given in Appendix F. Elevations range from 4830 to 5300 feet (1486 to 1767 m), and survey areas are located on slopes of approximately 3 degrees. The soil at all sites is alluvial, composed mainly of fine sand and silt intermixed with clay, coarse and fine gravel, and coarse sand. Abiotic conditions within the cluster are summarized in Table 3-35.

b. Disturbance: Sites 20 and 23 are undisturbed. Disturbance is low to moderate on other sites except for 2 and 3, which are highly disturbed. Grazing is the primary source of disturbance and off-road vehicles a secondary source on Sites 2, 4, 13, and 16. Off-road vehicles are the primary source of disturbance on Sites 17, 18, and 19. Grazing is the only disturbance noted on Sites 1 and 3, and off-road vehicle activity is the only disturbance noted on Sites 14, 15, and 21.

c. Threatened or Endangered Plant Species: Two individuals of *Coryphantha vivipara* were observed on Site 23. An alternative site was surveyed for possible relocation; four individuals were present in this area. This species is listed in the 1980 Federal Register as a Taxon Currently Under Review. It is a Category 2 plant as discussed previously. Individuals of *Opuntia*, *Gilia*, *Oenothera*, *Astragalus*, *Mentzelia*, *Eriogonum*, *Sphaeralcea*, *Gutierrezia*, *Cryptantha*, and *Machaeranthera* were observed, but species could not be identified due to the season of the survey. *Gutierrezia sarothrae* and *Machaeranthera*

	Shelter Site Number																								Resiting
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	23(c)
<u>Elevation</u> (feet)	5005	4860	4830	4910	4966	4935	4960	5030	5045	5010	5030	5100	5120	5250	5300	5273	—	5140	5195	5175	5090	5030	4960	—	4960
<u>Soil Texture</u>[a]																									
Coarse gravel	X					X	X	X		X	X	X	X	X	X	X				X	X			X	
Fine gravel						X	X	X		X	X		X	X	X	X				X	X			X	
Coarse sand						X	X	X			X		X	X	X	X					X			X	
Fine sand	X	X			X	1	1	X	X	X	X	X	1	1	X	X				X	1	1		X	
Silt	X	1	1	1	1	X	X	1	1	1	1	1	X	X	1	1	1	1	1	X	X	1	1	1	1
Clay	1					X	X	X			X		X	X	X	X				X				X	
<u>Disturbance</u>[a]																									
Offroad vehicles		2		2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1		1	2		2	2
Mining/const.																									
Erosion																									
Grazing	1	1	1	1	1	1	1	1	1	1	1	1	1			1	2	2	2	-		1	-	1	1
<u>Overall Intensity of Disturbance</u>[b]	M	H	H	M	M	L	L	L	L	M	L	M	M	L	L	L	-	M	M	-	M	M	-	L	M

(a) 1-Highest relative importance/impact; 2-lesser relative importance/impact; 3-lowest relative importance/impact; X-Indicates presence.

(b) H-High; M-Moderate; L-Low.

(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN CLUSTER 9 DRY LAKE VALLEY, NEVADA

TABLE 3-35

canescens were also present, but due to the season, the variety could not be determined.

d. Vegetation: The vegetation type varies from shadscale scrub at the lower elevations to sagebrush scrub at the higher elevations. The lower elevations are dominated by winterfat (*Ceratoides lanata*). As the elevation increases, big sage becomes the dominant plant. Other dominant shrub species in the community include little sage, rabbitbrush, *Gutierrezia*, Mormon tea, and hop sage. Two perennials, Indian rice grass and galleta grass, are dominant in scattered areas of the community.

The perennial vegetative cover ranges from 15 to 33 percent and averages 23 percent. Plant species observed in Cluster 9 are summarized in Table 3-36, and distribution of the dominant associations is mapped in Figure 3-31.

e. Wildlife: Wildlife observations in Cluster 9 are summarized in Table 3-37. Characteristic burrows indicate the presence of kit fox and gopher. Other, less characteristic mounds indicate the presence of additional, unidentified burrowing species throughout the cluster. The presence of the horse, antelope, coyote, kit fox, badger, and rabbit was determined from scat identification. Common wildlife observed included the black-tailed jackrabbit, side-blotched lizard, and horned lark. Less frequently observed species included the desert cottontail, grasshopper mouse, raven, meadowlark, and a raptor, the northern harrier.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	Resiting 23
AGAVACEAE																									
Yucca baccata														X											
ASTERACEAE (COMPOSITAE)																									
Ambrosia acanthicarpa																				X					
Artemisia spinescens	X	X		X	X				X			X					X	X		X		X	X	X	
Artemisia nova																			X			X	X		X
Artemisia tridentata						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	
Artemisia sp.	X																								
Chaenactis sp.										X															
Chrysothamnus greenei						X	X	X				X				X								X	
Chrysothamnus viscidiflorus	X								X		X	X		X	X	X	X	X	X	X	X		X		
Chrysothamnus sp.		X		X						X	X								X			X			
Gutierrezia sarothrae																		X					X		X
Gutierrezia microcephala																X									
Gutierrezia sp.	X	X																		X		X			
Machaeranthera canescens	X								X																
Machaeranthera sp.			X			X	X														X	X			
Stephanomeria sp.					X							X										X			
Tetradymia axillaris	X															X									
Tetradymia glabrata	X					X	X								X	X		X			X	X			
Viguiera multiflora									X	X															
BORAGINACEAE																									
Cryptantha sp.										X	X	X		X				X							
Lappula occidentalis	X	X			X					X					X	X		X		X	X	X		X	
BRASSICACEAE (CRUCIFERAE)																									
Caulanthus pilosus						X	X	X						X						X					
Descurainia sp.						X	X																		

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 9 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-36

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	Resiting 23
CACTACEAE																									
Coryphantha vivipara																							X		X
Opuntia echinocarpa	X							X	X	X	X			X		X	X		X	X	X				
Opuntia erinacea						X				X								X				X			
Opuntia sp.																								X	
CHENOPODIACEAE																									
Atriplex canescens				X	X			X												X	X				X
Ceratoides lanata	X	X	X	X	X	X			X								X	X		X		X	X	X	X
Grayia spinosa						X		X	X	X	X	X					X	X		X	X	X		X	
Salsola iberica	X		X		X				X	X												X			
CUPRESSACEAE																									
Juniperus osteosperma																X									
EPHEDRACEAE																									
Ephedra nevadensis	X										X		X	X	X	X			X	X					
FABIACEAE (LEGUMINOSAE)																									
Astragalus sp.						X								X	X										
LILIACEAE																									
Calochortus sp.														X											
LOASACEAE																									
Mentzelia sp.		X	X		X				X	X								X				X			
MALVACEAE																									
Sphaeralcea sp.	X			X	X	X	X		X	X			X		X				X		X			X	

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 9 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-36

	Shelter Site																								Resiting
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	23
ONAGRACEAE																									
Oenothera sp.										X															
POACEAE (GRAMINAE)																									
Aristida purpurea							X		X	X	X	X	X											X	
Bromus tectorum	X			X	X				X	X	X	X			X	X						X			X
Hilaria jamesii	X		X			X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Oryzopsis hymenoides			X	X	X	X		X	X	X		X			X	X	X	X		X	X	X		X	X
Sitanion hystrix	X		X	X		X	X		X	X	X		X	X	X	X	X	X	X	X	X				
Sporobolus cryptandrus			X	X					X	X							X	X				X	X		
Sporobolus contractus										X															
Stipa comata										X															
Vulpia octoflora	X																								
POLEMONIACEAE																									
Gilia sp.							X								X						X				
POLYGONACEAE																									
Eriogonum deflexum																		X							X
Eriogonum nidularium						X																			
Eriogonum sp.		X	X	X	X		X		X				X			X								X	
SOLANACEAE																									
Lycium andersonii																				X					

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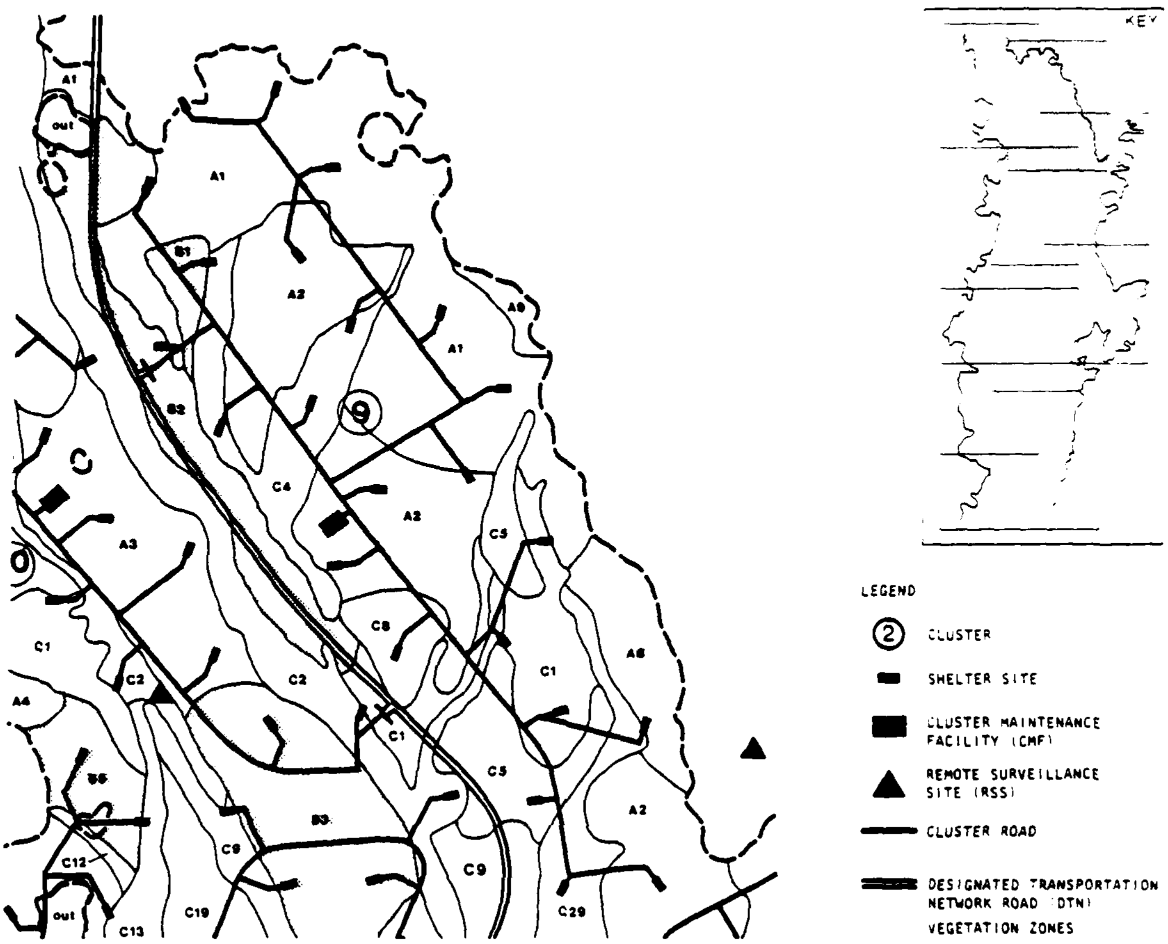
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 9 SITES
DRY LAKE VALLEY, NEVADA

PAGE 3 OF 3 TABLE 3-36



LEGEND

② CLUSTER

SHELTER SITE

CLUSTER MAINTENANCE FACILITY (CMF)

REMOTE SURVEILLANCE SITE (RSS)

CLUSTER ROAD

DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)

VEGETATION ZONES

A SAGEBRUSH

B TRANSITIONAL (SAGEBRUSH/SHADSCALE)

C SHADSCALE.

D TRANSITIONAL (SHADSCALE/CREOSOTE BUSH)

E PLAYA BARREN DRY LAKE BOTTOM

SEE APPENDIX E FOR KEY TO SYMBOLS

0 3,048 M
10,000 FT

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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 9

FIGURE 3-31

	Shelter Site																								Resiting
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OMF	23
Mammals																									
Horse (sign)	X			X					X					X	X		X	X				X			
Antelope (sign)			X											X											
Coyote (sign)		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	
Kit fox den (inactive)							X				X	X									X				
Kit fox (sign)		X																							
Badger (sign)															X										
Blacktailed jackrabbit	3	1				5	2					6	2	3		2		1		3	3	1		5	
Desert cottontail								1		1	3			1	1			1			2				
Rabbit (sign)	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X			X	
Grasshopper mouse						1																			
Gopher mounds																						X			
Mammal burrows	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	
Birds																									
Horned lark	P	P	P	P	P	P	P	P	P	P	P	P	P	P			P	P			P	P		P	
Raven					2		1					1				2			2			1		2	
Northern harrier																						1			
Meadowlark																	2								
Reptiles																									
Side-blotched lizard	30	5	6	4	9	19	4	11									10	12			3	7			

Number = Actual sightings; P = Present but not counted; X = Sign observed.

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SUMMARY OF WILDLIFE OBSERVED
IN CLUSTER 9 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-37

3.2.5.10 Summary of Conditions in Cluster 10

a. Abiotic Conditions: The legal descriptions for Cluster 10 are given in Appendix F. Elevations range from 4880 to 5570 feet (1502 to 1714 m), and all survey areas are located on slopes of approximately 3 degrees. The soil at all sites is alluvial, composed of silts, clays, sands, and gravels. Abiotic conditions within the cluster are summarized in Table 3-38.

b. Disturbance: Grazing is the primary source of disturbance and off-road vehicles a secondary source on the majority of the sites (1 through 4, 6 through 13, 16 through 18, 20, and 23). Off-road vehicle disturbance was greater than grazing disturbance on Sites 1 and 15 and was the only disturbance on Sites 19, 21, and 22. Grazing is the only disturbance on Sites 1, 6, 7, and 9 through 12. On Site 5, activity from other animals is the primary source of disturbance and off-road vehicle damage a secondary source. The intensity of disturbance is considered low to moderate on all sites.

c. Threatened or Endangered Plant Species: One individual of *Coryphantha vivipara* was observed on Site 16. This species is listed in the 1980 Federal Register as a Taxon Currently Under Review. It is a Category 2 plant as discussed previously. Individuals of *Erigeron*, *Opuntia*, *Gilia*, *Eriogonum*, *Astragalus*, *Mentzelia*, *Cryptantha*, *Senecio*, and *Machaeranthera* were also observed, but due to the season of the survey, species could not be identified. *Gutierrezia sarothrae*, *Machaeranthera canescens*, and *Astragalus lentiginosus* were also observed, but the variety could not be determined due to the season.

	Shelter Site Number																								Resitings	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS5	12	16(c)
<u>Elevation (feet)</u>	4880	4910	4933	4945	5180	5110	5000	4972	5120	5000	5030	5040	5090	5230	5130	5190	5210	5145	5355	5250	5435	5520	5570	5000	4935	5050	5205
<u>Soil Texture</u>(a)																											
Coarse gravel		X	X		1	X	1	X	1	1	X	X	X			X	X	X	X	X	X	X	X	X		X	
Fine gravel		X	X		X		X		X	X		X	X					X	X	X	X	X	X			X	
Coarse sand		X			X	1	X	X	X	X								X	X	X	X	X	X		X		
Fine sand		1	1	X		X					X		1			X	X	X	X	X	X	X	X	X			
Silt	1	X	X	1				1			1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Clay		X		X												X	X	X	X	X	X	X	X	X			
<u>Disturbance</u>(a)																											
Offroad vehicles		2	2	2	2			2					2	1	1	2	2	2	1	2	1	1	2	2	2		2
Mining/const.																											
Erosion																											
Grazing	1	1	1	1		1	1	1	1	1	1	1	1	2	2	1	1	1		1			1	1	1	1	1
<u>Overall Intensity of Disturbance</u>(b)	M	M	L	M	L	L	L	M	L	L	L	L	M	L	L	L	L	L	-	L	L	-	L	L	H	L	M

(a) 1-Highest relative importance/impact; 2-lesser relative importance/impact; 3-lowest relative importance/impact; X-Indicates presence.

(b) H-High; M-Moderate; L-Low.

(c) Surveyed but not relocated.

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SUMMARY OF ABIOTIC FACTORS IN
CLUSTER 10
DRY LAKE VALLEY, NEVADA

TABLE 3-38

d. Vegetation: The community is transitional, composed of species typical of the shadscale and sagebrush vegetation zones. Dominant shrub species in the area include hop sage, winterfat, Mormon tea, little sage, big sage, rabbitbrush, *Gutierrezia*, and saltbrush. Perennial grasses, *Sporobolus cryptandrus*, galleta grass, and Indian ricegrass, are dominant in various areas of the community.

The perennial vegetative cover in Cluster 10 ranges from 15 to 43 percent and averages 24 percent. Plant species observed in Cluster 10 are summarized in Table 3-39, and distribution of the dominant associations is mapped in Figure 3-32.

e. Wildlife: Wildlife activity observed in Cluster 10 is summarized in Table 3-40. Characteristic burrows indicate the presence of the antelope ground squirrel and gopher. Less characteristic mounds denote the presence of additional unidentified burrowing species throughout the cluster. The presence of horse, antelope, coyote, kit fox, badger, and rabbit was determined from scat identification. Common wildlife observed included the blacktailed jackrabbit, horned lark, and side-blotched lizard. Wildlife less frequently observed included the desert cottontail, raven, and sage sparrow.

3.2.6 Results of the DTN and Cluster 2 Roads Surveys

3.2.6.1 Abiotic Conditions

The Designated Transportation Network (DTN) runs approximately 40 miles (64 km) through the valley from north to south. The

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS5	Resitings 12	16(a)
AGAVACEAE																											
Yucca baccata																					X						
ASTERACEAE (COMPOSITAE)																											
Acamptopappus sp.												X														X	
Ambrosia acanthicarpa								X																			
Artemisia nova														X			X			X	X	X	X				
Artemisia spinescens	X		X	X		X	X		X		X	X	X			X	X	X						X	X	X	X
Artemisia tridentata					X	X	X		X	X	X	X	X			X		X	X	X				X		X	
Chaenactis sp.	X	X						X																			
Chrysothamnus greenei								X						X													
Chrysothamnus viscidiflorus					X	X	X			X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Chrysothamnus sp.	X	X	X																								
Erigeron sp.																				X	X						
Gutierrezia sarothrae						X			X					X							X				X		X
Gutierrezia microcephala																X	X			X	X						
Machaeranthera canescens							X			X	X	X	X		X			X	X	X			X		X	X	
Machaeranthera sp.	X	X																									
Senecio sp.																						X	X				
Stephanomeria sp.		X																									
Tetradymia axillaris			X				X		X	X	X	X					X							X		X	
Tetradymia glabrata					X	X		X	X	X	X			X								X		X	X		
Viguiera multiflora																											X
BORAGINACEAE																											
Cryptantha sp.		X	X					X			X										X						
Lappula occidentalis	X																					X					
BRASSICACEAE (CRUCIFERAE)																											
Caulanthus pilosus	X					X												X	X	X		X	X				
Descurainia sp.				X		X	X			X	X		X														

(a) Surveyed but not relocated.

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MX SITING INVESTIGATION
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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 10 SITES
DRY LAKE VALLEY, NEVADA

TABLE 3-39

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS5	Resitings 12	16
CACTACEAE																											
Coryphantha vivipara																X											
Opuntia erinacea	X		X			X		X	X	X	X					X					X				X		
Opuntia echinocarpa						X				X		X	X						X					X		X	
Opuntia sp.																								X			
CHENOPODIACEAE																											
Atriplex canescens	X			X		X	X		X		X	X	X	X		X		X	X		X	X		X	X	X	X
Ceratoides lanata	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Grayia spinosa	X		X	X	X	X	X	X	X	X	X	X	X					X	X			X	X	X	X	X	X
Salsola iberica				X												X											
CUPRESSACEAE																											
Juniperus osteosperma																					X	X					
EPHEDRACEAE																											
Ephedra nevadensis		X	X		X	X		X		X	X	X	X	X				X	X		X	X	X	X		X	X
FABIACEAE (LEGUMINOSAE)																											
Astragalus lentiginosus						X				X	X	X												X		X	
Astragalus sp.	X	X																	X				X				
LINACEAE																											
Linum perenne																						X	X		X		
LOASACEAE																											
Mentzelia sp.	X																			X							
MALVACEAE																											
Sphaeralcea ambigua							X			X	X	X	X	X	X			X	X	X			X	X	X	X	X
Sphaeralcea sp.	X	X	X					X								X											

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SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 10 SITES
DRY LAKE VALLEY, NEVADA

PAGE 2 OF 3 TABLE 3-39

Species	Shelter Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMF	RSS5	Resitings 12	16
POACEAE (GRAMINAE)																											
Aristida purpurea		X	X					X		X	X	X	X											X		X	
Bromus rubens				X																							
Bromus tectorum		X	X	X			X	X	X	X	X	X	X	X				X	X	X	X				X	X	X
Hilaria jamesii	X	X	X		X	X		X	X	X	X	X	X			X	X	X	X	X				X	X	X	X
Oryzopsis hymenoides	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
Sitanion hystrix	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X		X		X	X	X	X	X	X
Sitanion jubatum																								X			
Sporobolus contractus										X	X		X											X			
Sporobolus cryptandrus	X	X	X					X												X				X			
Stipa comata								X		X										X	X		X				
Vulpia octoflora																					X						
POLEMONIACEAE																											
Gilia sp.																				X		X					
POLYGONACEAE																											
Eriogonum deflexum				X			X			X	X		X														X
Eriogonum inflatum																											X
Eriogonum nidulatum	X	X	X							X																	
Eriogonum sp.	X	X																X		X	X	X					
ROSACEAE																											
Cowania mexicana																						X	X				
SOLANACEAE																											
Lycium andersonii		X				X			X	X	X		X			X								X			X

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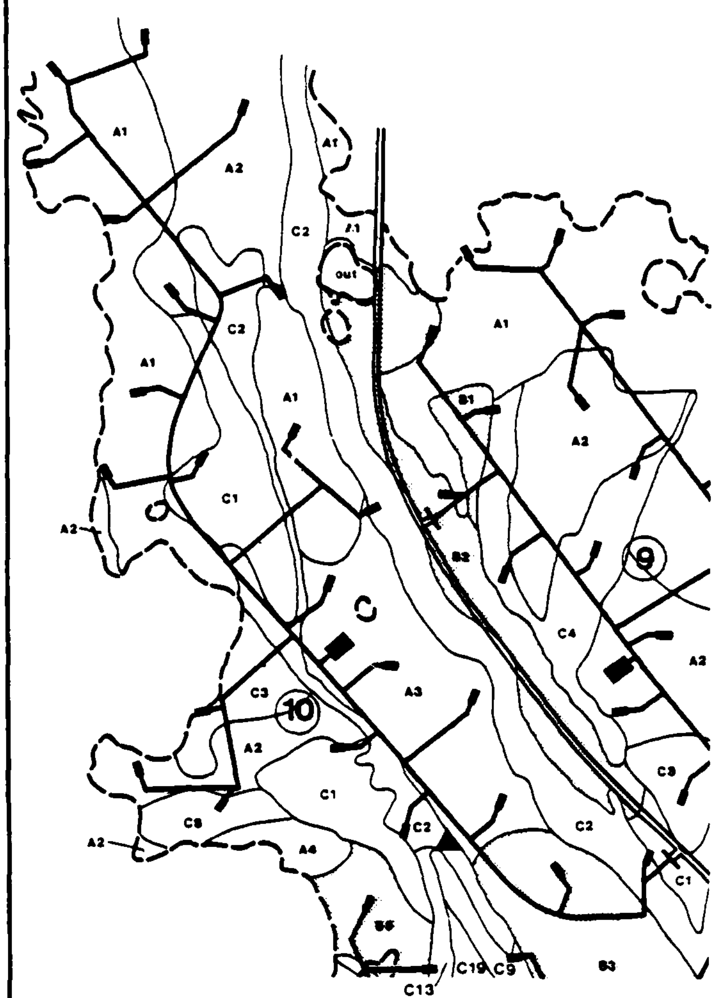
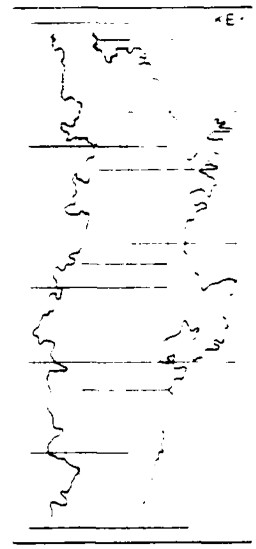
SUMMARY OF PLANT SPECIES
OBSERVED IN CLUSTER 10 SITES
DRY LAKE VALLEY, NEVADA

 TABLE 3-39





LEGEND

(2) CLUSTER

SHELTER SITE

CLUSTER MAINTENANCE FACILITY (CMF)

REMOTE SURVEILLANCE SITE (RSS)

CLUSTER ROAD

DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)

VEGETATION ZONES

A SAGEBRUSH

B TRANSITIONAL (SAGEBRUSH/SHADSCALE)

C SHADSCALE

D TRANSITIONAL SHADSCALE CREOSOTE BUSH

E PLAYA BARREN DRY LAKE BOTTOM

SEE APPENDIX E FOR KEY TO SYMBOLS

N

0 3,048 M
10,000 FT

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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN CLUSTER 10

FIGURE 3-32

	Shelter Site																									Resitings	
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	CMP	RSS5	12	16(a)
Mammals																											
Horse (sign)		X	X	X	X			X	X											X	X		X		X		
Antelope (sign)		X												X	X			X	X								
Coyote (sign)	X	X								X	X	X			X	X		X		X			X	X	X	X	X
Kit fox (sign)					X		X															X					
Badger (sign)														X	X												
Blacktailed jackrabbit		2	1			1		3	1		1	2	15	7	1	1		5	13		2	2	1	3		P	
Desert cottontail					1							1			1	1										P	1
Rabbit (sign)	X	X		X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X
Ground squirrel burrow (active)								X				X														X	
Ground squirrel burrow (inactive)				X			X			X	X					X											
Gopher mounds												X											X			X	
Mammal burrows (active)	X	X	X	X	X		X	X		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X
Mammal burrows (inactive)	X	X	X	X	X	X	X		X	X		X	X	X		X	X		X		X	X	X	X	X	X	X
Birds																											
Horned lark	P		P	P				P	P		P		P	P	P	P		P		P				P			P
Raven														1	2		11			1							
Sage sparrow		1	1										1														
Reptiles																											
Side-blotched lizard	17	14	5					6				8	6	7	18		15	5	25			3		10		P	

(a) Surveyed but not relocated.

Number - Actual sightings; P = Present but not counted; X = Sign observed.

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SUMMARY OF WILDLIFE OBSERVED IN CLUSTER 10 SITES DRY LAKE VALLEY, NEVADA

TABLE 3-40

elevation of the DTN and Cluster 2 roads varied with the terrain but was usually very close to 4600 feet (1415 m) and was generally located on slopes of 3 degrees or less. The soil was composed of alluvial material.

3.2.6.2 Disturbance

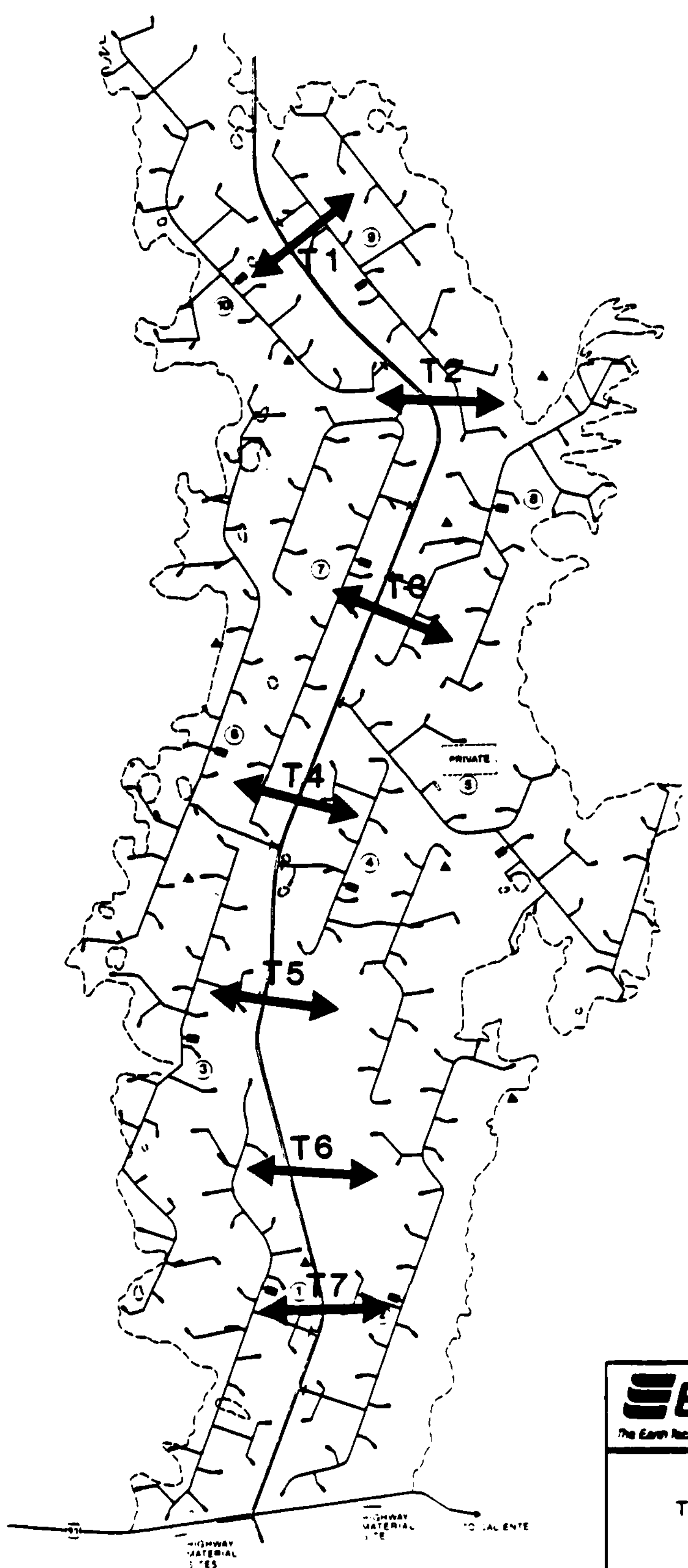
Disturbance caused by grazing and off-road vehicle usage was noted throughout the entire DTN and cluster road study area. Much of the off-road vehicle disturbance was probably the result of the surveyors rather than previous activity, although it was not usually possible to distinguish between the two.

3.2.6.3 Threatened and Endangered Plant Species

No threatened, endangered, or sensitive plant species were observed on the DTN or Cluster 2 roads during the survey.

3.2.6.4 Vegetation

A visual survey was conducted for the entire 40 miles (64 km) of DTN, as well as for the 20 miles (32 km) of roads in Cluster 2. Transects were made at 5-mile (8-km) intervals along the DTN and at three locations within Cluster 2 to obtain quantitative data on cover and density. Transect locations and dominant species are shown in Figure 3-33. Percent perennial cover on the DTN ranged from 15 to 29 percent and averaged 20 percent. Cover within the Cluster 2 roads ranged from 23 to 32 percent and averaged 27 percent. The dominant species is *Ceratoides lanata* in association with *Atriplex* and *Artemisia* species. Transect data are given in Appendix E.



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TRANSECT LOCATIONS ON THE DTN

FIGURE 3-33

3.2.6.5 Wildlife

The wildlife observed along the DTN and Cluster 2 roads was similar to that of the surrounding clusters. The blacktailed jackrabbit, horned lark, and side-blotched lizard were ubiquitous. Antelope scat was observed in the area 15 to 20 miles (24 to 32 km) from the north end of the DTN, and many kit fox dens were observed also, but all were abandoned. No evidence of threatened or endangered wildlife was observed.

3.3 RESITINGS

Resitings were instituted by the Air Force to mitigate by avoidance when possible. The shelter spacing criteria were somewhat flexible; shelters located in highly sensitive areas could therefore sometimes be relocated to avoid significant cultural resources, biological features, or areas where geotechnical difficulties might affect construction. A number of resitings were made for cultural resources or geotechnical reasons, but none were made for biology. Resitings are listed in Table 3-41.

In general, it was possible to relocate a site within 400 feet (124 m) of the original location and avoid the problem on the original site. A relocated site was, in many cases, part of the original survey area, and data obtained from the relocated site are therefore often similar to data from the original site. The data from relocations have been incorporated into the appropriate cluster to help provide overall pictures of the clusters. Transect data are given at the end of Appendix E. In some cases, due to the proximity of the original and the relocated sites, additional transects were not necessary.

SITE NUMBER	RESURVEY RATIONALE	SITE NUMBER	RESURVEY RATIONALE
Sites Relocated			
HSS 2/6	survey adjustment	HSS 2/9	survey adjustment
HSS 2/22	geotechnical	HSS 2/23	geotechnical
HSS 3/1(a)	criteria	HSS 3/5	cultural findings
HSS 4/1	geotechnical	HSS 4/2	cultural findings
HSS 4/3	cultural findings	HSS 4/22	geotechnical
HSS 4/4	criteria	HSS 5/9	geotechnical
HSS 5/5	criteria	HSS 5/19	geotechnical
HSS 5/12	geotechnical	HSS 5/22	geotechnical
HSS 5/20	geotechnical	HSS 6/2	criteria
HSS 6/1	geotechnical	HSS 8/21	geotechnical
HSS 8/18	geotechnical	HSS 6/18	geotechnical
HSS 10/12	geotechnical	HSS 7/2	geotechnical

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FACILITY RESITINGS IN
DRY LAKE VALLEY

TABLE 3-41

An additional 10 sites were considered for relocation due to biological reasons and were biologically resurveyed; however the sites were not relocated and are not listed in Table 3-41.

The first criterion in the determination of whether of not to resite for biological reasons in the IOC valleys was the presence of a threatened or endangered (T/E) species. The identification of even a single individual of a T/E species within the survey area is sufficient to consider relocation. Relocation was also considered for protected species such as game animals, but only if the species population was potentially affected by factors such as by blockage of a migration route, disturbance of key habitat, or other factors. Relocation was not considered for single individuals of protected species.

Species-specific characteristics were evaluated in relocation decisions. The federal and state status of the species, the number of individuals and populations within the valley and surrounding area, the amount of critical habitat and proportion of population affected, the species habitat requirements, adaptability, tolerance of human activity, critical seasons, and other factors were taken into account.

No federally listed species were expected to be directly impacted by the project in Dry Lake Valley. If such species had been identified, it would have been necessary for the Air Force to consult with the U.S. Fish and Wildlife Service following Section 7 procedures. Species listed in the Taxa Currently Under Review category in the Federal Register were treated as

candidate species for federal listing, and mitigation by avoidance would be instigated if the field survey encountered a group of individuals of a candidate species. However, only scattered individuals of such species were observed in Dry Lake Valley, and in many cases, these were located in the buffer zone rather than on the actual shelter site itself. When candidate species were found, a number of recognized plant authorities were consulted; it was decided that mitigation by relocation of facilities was unnecessary because of the small number of individuals affected.

For biology, mitigation by avoidance will often not be sufficient if relocation is confined to an area a few hundred feet from the original site, as larger, mobile animals may be sensitive to disturbance from a great distance. In other IOC valleys, for example, sage grouse are present. A 1.8-mile (3-km) buffer zone around strutting grounds is recommended for this species (Day, 1980; and Braun, 1977). In such situations, resiting in the immediate area is of little use. Thus, while the project will impact antelope and mule deer in the northern part of the study area, no mitigation through resiting was recommended for wildlife species.

4.0 SUMMARY OF IMPACTS AND MITIGATION MEASURES

4.1 POTENTIAL IMPACTS

At the request of the BLM, a summary of the potential impacts of construction and operation of the MX system in the IOC valleys has been included in this report. The summary is based on the Deployment Area Selection and Land Withdrawal/Acquisition DEIS (HDR, 1980) supplemented with additional material where appropriate. Measures designed to mitigate many of these impacts are described in the following section.

The Dry Lake study area encompasses approximately 210,000 acres (84,986 ha); construction will directly disturb approximately 4600 acres (1862 ha), or approximately two percent of the study area. However, the MX system must be viewed as a whole, rather than as numerous scattered facilities, because the DTN and cluster roads will result in increased accessibility and presence of the system will cause indirect biological impacts affecting the entire valley. Likewise, because MX deployment will affect many valleys in addition to Dry Lake, the whole system should be taken into acccount when evaluating effects. Destruction of a population in one valley may be of little consequence if many nearby valleys support additional populations; if populations in the other areas are also affected, however, the single valley population may then bedome of greater importance to the species.

Because shelter sites were selected for particular geologic and topographic characteristics, the species that require these

same characteristics for habitat will tend to be impacted at all sites within the valley. Effects on some species preferring this habitat, especially the larger, more mobile, and more visible organisms, such as game species or other animals that require a large range, may be considerable. The extent of the effects will be influenced by the construction approach and mitigation measures adopted by the Air Force.

Direct impacts to plants and wildlife will be caused mainly by destruction of a portion of the habitat due to construction or grading. Long-term indirect impacts are likely to be more damaging; however, they will also be more difficult to measure or observe. Indirect impacts include lowering of the water table due to increased water usage and increased access to the area through road construction. Possible effects of increased access would be numerous, including an increase in poaching, disturbance of nesting, breeding or feeding cycles, reduction of prey populations, and increased off-road vehicle usage. Increased traffic may affect animal movements and cause increased mortalities as well. Specific impacts are discussed below.

4.1.1 Hydrology

Effects on existing hydrologic pattern in Dry Lake Valley may include alteration of surface drainage patterns and percolation rates, effects on the existing water rights and water quality, drawdown of the water table and decrease in recharge and subsequent subsurface flow to down-gradient users. Construction

of 240 miles (384 km) of roads and 230 shelters may result in water channelization and blockage of overland flow. Other effects of road construction include a possible increase in ponding, erosion, soil compaction, and flow concentration, all of which tend to alter surface water resources and decrease expected ground-water recharge and storage (HDR, 1980a).

Increased water usage or decreased recharge that result in a drawdown of the water table could severely inhibit biological processes in a region such as Dry Lake Valley where water is a limiting factor. Lowering the ground-water table may destroy or weaken vegetation communities in some areas and have potentially adverse effects on important wetland habitats hydrologically connected to Dry Lake Valley. Such important aquatic habitats are located in Pahranagat and White River valleys; many occur within federal or state wildlife refuges.

Drainage diversions may cause both short- and long-term changes in vegetation. Concentration of flow may cause increased erosion, resulting in loss of vegetation. Recolonization by other, less desirable species, or species better able to tolerate the new conditions, may occur. Increased soil moisture in ponding areas may eventually result in establishment of new species that require higher moisture levels (Wallace and Romney, 1972).

4.1.2 Grazing

The development of the MX system in Dry Lake Valley may impact grazing by altering or reducing existing grazing allotments,

and it may lead to overgrazing due to reduced habitat. Other potential impacts include increased animal rustling, vandalism of facilities, and general disturbance of livestock.

Water sources are especially critical to continued cattle grazing. Because cattle need to graze in reasonable proximity to drinking water sources, loss of one water source may prevent the use of up to 50 mi^2 (110 km^2) of grazing land (HDR, 1980). The reduction of suitable grazing habitat may also result in overgrazing of other presently undisturbed areas.

4.1.3 Vegetation

Natural revegetation of disturbed desert lands is a very slow process (Wallace, and others, 1977). The National Academy of Sciences (1974) has estimated that the recovery of native vegetation in areas receiving less than 10 inches of annual precipitation will require decades to centuries.

The greatest impact to the flora in Dry Lake Valley will be habitat reduction through removal of vegetation and habitat degradation by invasion of introduced species in disturbed areas. Direct impacts will result from the construction of the shelter sites, remote surveillance sites, cluster maintenance facilities, designated transportation network, and cluster roads. It is anticipated that construction will disturb 7.5 acres (3 ha) at each shelter for a total of 1725 acres (697 ha), and a 100-foot (33-m) right-of-way for all roads disturbing 480 acres (194 ha) for the 40 miles (64 km) of DTN and 2400 acres (970 ha) for the 200 miles (320 km) of cluster roads (HDR, 1980).

An additional undetermined amount of ground will also be disturbed for borrow pits and material transport roads.

Habitat directly impacted by construction of permanent facilities would thus encompass approximately 4600 acres (1858 ha), or about two percent of the study area within the valley. Additional disturbance would be associated with temporary construction facilities. Indirect impacts, however, could affect a much greater area. Over 40 percent of the Dry Lake Valley hydrologic subunit (hydrographic area 181) is within one-half mile of a disturbed area. The potential impact to both vegetation and wildlife is high (HDR, 1980a).

Changes in grazing patterns will affect vegetation composition. The successional patterns in many Great Basin sagebrush and shadscale communities change significantly as a result of overgrazing (Holmgren and Hutchings, 1972; and Young and others, 1972). Many areas previously supporting distinctive plant associations now support similar, degraded vegetation as a result of grazing impacts. Grazing has often altered communities to the extent that the original composition is no longer discernable and the pattern of recovery is uncertain. This is apparently related to modified plant-soil relationships, but the mechanisms are not well understood (Holmgren and Hutchings, 1972).

Shadscale (salt desert shrub) vegetation is the most common community in Dry Lake Valley. It is highly variable and

often unpredictable in terms of secondary succession patterns that follow disturbance.

In many sagebrush communities, grazing has reduced or eliminated the perennial grasses and changed the shrub composition. Shrubs least preferred for grazing have increased in dominance, while preferred forage species have become less common. Introduced annuals, including Russian thistle (Salsola iberica), tumble mustard (Sisymbrium altissimum), and cheatgrass (Bromus tectorum), are now very widespread; they form such a complete understory in some degraded communities that reestablishment of native perennial grasses is often precluded and fire behavior and secondary succession are also altered (Young and others, 1972; and Young and Evans, 1973). Without additional disturbance, Russian thistle will be gradually replaced by sagebrush on many of the higher elevation sites (Holmgren and Hutchings, 1972).

The invasion of disturbed areas by Halogeton glomeratus, an introduced weed, may have a major impact on grazing in Dry Lake Valley. Halogeton is toxic to livestock (Cronquist and others, 1972), and it spreads rapidly in disturbed alkaline soil in low bajadas and lake plains. This species can become established in the alkali sink scrub on the periphery of the playa and in the shadscale scrub, which is by far the most common vegetation type throughout the valley.

The successional characteristics and recovery potential of the alkali sink scrub vegetation are unknown. In the shadscale

scrub, halogeton is gradually replaced by rabbitbrush, winterfat, or shadscale if disturbance is light (HDR, 1980a). If disturbance is severe or repeated, halogeton can alter the soil chemistry and exclude native vegetation (Cook and Stoddart, 1953). It has been speculated that halogeton may prevent native species reestablishment for over 50 years (Eckert and Kinsinger, 1960). Studies have suggested that the only effective control method is competition with perennial species (Cleaves and Taylor, 1979).

Disturbed areas on the coarse substrates of the bajadas will probably be invaded by Russian thistle (Salsola iberica). Russian thistle will be succeeded by tumble mustard (Sisymbrium altissimum), followed by tansy mustard (Descurainia spp.) and eventually by cheatgrass (Bromus tectorum) if disturbance is minimal and infrequent (HDR, 1980a). If disturbance is repeated, the successional sequence will revert back to Russian thistle, which may remain for 15 years or more (Stewart and others, 1940).

Russian thistle tends to dominate cleared areas of Great Basin sagebrush when a seed source is available (Young and Evans, 1973). The successional pattern of a Great Basin sagebrush community involves an initial domination by either climax perennial grasses or root-sprouting shrubs and perennial grasses such as squirreltail (Sitanion histrix) and Sandberg bluegrass (Poa sandbergii). In communities with a climax of perennial grasses, sagebrush normally becomes the dominant species in the

area; when a high density of alien annual grasses becomes established, however, recurring fires may limit reestablishment of sagebrush (Young and Evans, 1978).

4.1.4 Wildlife

Construction activities will result in both direct and indirect impacts on wildlife. Wildlife burrows, dens, and habitat will be destroyed on sites where facilities are constructed. Wildlife may be affected by the presence of lighting at night or by increased noise and human activity. If poaching or indiscriminate shooting increases, population of the larger or more visible species may be reduced in the valley.

The ability of an individual to relocate depends on its mobility, habitat availability, and the carrying capacity of the undisturbed habitat. Small animals such as rodents, lizards, and snakes may lose their entire home range within a single cleared area. These species are less able to relocate than more mobile species.

The removal of food sources and habitats used by rodents and small birds will reduce the density of these species. While these species are not considered threatened or endangered, population reductions may, in turn, lead to a decline in density of raptors and other species which rely on them as forage. Many predators live in the mountains adjacent to Dry Lake Valley and enter the valley to feed. Activity within the valley may therefore affect ecosystems outside of the valley itself.

In desert habitats, where resources are limited, wildlife populations are especially dependent on small populations of plants. Desert ecosystems are particularly fragile because they contain many highly specialized organisms that cannot easily adapt to changing conditions. Thus, the loss of habitat in Dry Lake Valley will result in a reduction of available food and protection for wildlife which is proportionately more significant in this environment than would be the case in other, less fragile, areas.

The successional pattern of wildlife in temporarily disturbed areas in Dry Lake Valley will generally follow plant succession. Animal species dependent upon specific narrow habitats, such as the desert night lizard (Xantusia vigilis) which is dependent on the Joshua tree (Yucca brevifolia) found in southern Dry Lake Valley, will be heavily impacted by even temporary disturbance of vegetation.

Construction activities may crush many reptiles and diurnal rodents as well as compact the soil, resulting in the death of nocturnal or hibernating animal species. The noise and activity from construction may interrupt movement, hibernation, nesting, breeding or other activities, thus adversely affecting wildlife populations in the area. For example, mule deer may avoid their key winter area in the northeast portion of the valley. Increased recreational use in mountain habitats surrounding Dry Lake Valley may prevent bighorn sheep from using waterholes or other water sources, and recreational use of riparian areas near the valley may prevent their use by bobcats.

Migration routes and movements may also be affected by the road and shelter locations.

The MX system may adversely impact antelope populations in the northern portion of the valley. Although antelope kidding grounds, usually located in the pinyon-juniper areas along the valley sides, will probably not be directly affected, antelope may be subject to increased poaching and habitat disturbance in other parts of their range.

Wildlife destruction resulting from poaching and recreational shooting could be especially critical during construction periods. Raptors, game birds, some animals, and small mammals are all vulnerable to these activities. Impacts will be less severe during operation of the system. However, the additional roads will lead to increased accessibility and a higher volume of traffic. An increased number of animals will be killed by traffic. This may be particularly true of small birds, rodents, and reptiles which are attracted to roadsides (Cornett, 1980). Kit foxes, a protected species, are known to sit on paved roads at night, presumably to absorb radiated warmth (Eqoscue, 1960). This behavior may lead to increased mortality after road construction in the valley. Roads will bring key-use areas of mule deer and antelope within easier reach.

4.1.5 Vehicle Use

Both compaction and soil erosion are likely to result in changes in vegetative cover, species composition, and plant productivity. In arid areas, the damage to vegetation by off-road

vehicles can be clearly observed; the resulting disturbance to soil characteristics and animals is less obvious (Stebbins, 1954; Bussack and Bury, 1974; and Luckenbach, 1975). Due to the slow growth of desert vegetation, these effects may remain for years. If off-road use is sufficiently high, intense damage can be done to the desert in a matter of hours (Carter, 1974). Desert soils are highly vulnerable to disruption (Webb, 1976; and Eckert and others, 1976), and compaction of soil can result in decreased soil permeability and water holding capacity (Davidson and Fox, 1974; and Wilshire and Nakata, 1976). The full extent of damage may not be evident until years or even decades after the original disturbance (Wilshire and Nakata, 1976).

Construction equipment and off-road vehicles will compact the soil and change its structure, decreasing water infiltration and increasing runoff. Compaction also restricts root penetration and reduces soil aeration (Taylor and Ashcroft, 1972). Construction will reduce the vegetative cover and break desert pavement, allowing accelerated wind erosion. The results of erosion include loss of productive topsoil, exposure of root systems to desiccation and abrasion, and possible burial of downwind vegetation (Brady, 1974). Once begun, wind and water erosion will continue to impact the soils unless control measures are taken.

In dry areas, vehicle travel on unpaved roads and wind erosion in disturbed areas cause a significant amount of fugitive dust. Cement plants, aggregate quarries, and related activities will produce additional dust. The effect of dust on vegetation

depends upon the plant species. Long-term exposure to dust may cause changes in species composition (Wood, 1976). Daubenmire (1974) has shown that deciduous plants are less affected by dust accumulation than evergreen species. Beatley (1965) has attributed the defoliation of creosote bushes (Larrea divaricata) to heavy dust covering. The amount of rainfall and the interval between rainfalls are also important factors. Vegetation in the vicinity of the dust sources is likely to be most heavily impacted.

The use of leaded fuel produces compounds which accumulate in roadside soils. The exhaust contains a highly soluble chromobromide that becomes incorporated into plants through foliar absorption (Hammond and Aronson, 1964). A study conducted on Highway 95 in southern Nevada showed lead content in plant foliage along the highway to be 10 times above normal (Romney, 1973). High concentrations of lead can impact plant growth in low phosphate soils and may possibly become concentrated in herbivores ingesting the plants. It is unknown whether these effects will be significant after construction of additional roads in Dry Lake Valley.

4.2 MITIGATIONS

A number of mitigation measures for biological resources have been proposed in the Deployment Area Selection and Land Withdrawal/Acquisition DEIS. It is the policy of the U.S. Air Force to mitigate by avoidance wherever possible. Since it is impossible to avoid all biological species and habitats, a number of

other mitigation measures have been proposed by the U.S. Air Force Environmental Impact Statement that could reduce or eliminate many of the potential impacts described in the previous section. These measures are described below.

One of the most important mitigation measures may be the implementation of an education program for construction and operation workers to increase awareness of the fragility of the desert environment.

4.2.1 Abiotic Mitigations

The abiotic environment is directly related to all plant and animal life in Dry Lake Valley. Mitigation measures reducing the impact of the project on abiotic components will benefit both plant and wildlife species in the valley. Planned control of fugitive dust during all phases of the project will decrease soil loss and minimize the effect on adjacent vegetation. Oiling or paving roads, consolidation of material transport to reduce traffic, enforcement of low speed limits on unpaved roads, use of prefabricated buildings to decrease construction time, simultaneous installation of all structures within an area where possible, and prohibition of off-road driving are measures which will reduce generation of fugitive dust.

4.2.2 Grazing Mitigations

If grazing allotments are reduced by the proposed MX system in Dry Lake Valley, the number of cattle currently grazing there will have to be reduced, new range will need to be opened, or

improvement in range management practices will be needed in order to make better use of existing rangelands.

Recommendations of range biologists concerning available forage on a given parcel determine the number of cattle allowed to graze. A range is rated in terms of Animal-Unit-Months (AUMs). An AUM is defined as the amount of forage necessary to sustain one cow or five sheep for one month (U.S. Department of the Interior, 1980c). Improved management practices may increase the number of AUMs in a given area.

Cattle allowed to graze without controls will tend to overgraze a convenient area instead of moving to new forage areas. Construction of trails through timber to new forage areas and the salting of new areas both encourage use of more range.

Water sources are critical since cattle will graze only a limited distance from water. On hilly land, water is even more important; cattle will graze .75 mile (1 km) upslope from water on a 10 percent slope, but only .1 mile (.16 km) from water on a 60 percent slope (U.S. Department of Agriculture, 1965). Developing new water sources would open up lands presently not usable as range.

A pilot experimental stewardship program providing incentives for ranchers to use innovative management practices is to be implemented in the Tonopah Resource Area in 1981 (U.S. Department of Agriculture, 1965). The results of this program will help determine the effectiveness of various management practices.

A common current practice for creating new rangelands is the planting of crested wheatgrass (Agropyron desertorum) in areas previously containing sagebrush or juniper. Areas are burned, seeded, and closed off to prevent grazing until the plants are established. This may be a possible method of replacing grazing land lost due to project construction. However, this practice replaces existing communities which are of value to raptors, antelope, and other wildlife. The intrinsic values of this land must be carefully evaluated in terms of the ecosystem ecology, total available habitat, carrying capacity, and value to livestock before this practice is implemented.

4.2.3 Wildlife Mitigations

Mitigation can minimize the destruction of wildlife species and their habitat if the project is carefully planned and construction activity regulated in conjunction with an environmental management plan. Such measures include avoiding activity within key winter range in the winter and avoiding activity near watering areas during the summer, when water is a critical factor. The purchase of grazing AUMs and retiring of grazing areas would also reduce competition for water and be beneficial to wildlife. Construction should be planned to reduce human activity, noise, and visibility of structures as much as possible.

Disturbance of existing water sources should be avoided and corridors allowing wildlife access should be retained where possible. Artificial water sources should be constructed to

replace any existing water sources that may be affected. Their design should incorporate other factors essential to wildlife survival, such as escape and access routes and protective cover. Nesting platforms should be designed in conjunction with water sources to protect avian species.

Where grazing habitat is reduced, precautions should be taken to prevent domestic herds from overgrazing the remaining habitat and to prevent further loss of natural habitat. Precautions should be employed to minimize soil compaction caused by trampling and to reduce the destruction of burrowing and sessile species and their habitats.

One of the most severe impacts on wildlife can result from increased human activity, especially by construction workers and other transient personnel. An information-education program for people involved in construction and operation of the system and the prohibition of firearms would reduce impacts on wildlife. A firearms restriction would reduce recreational shooting and poaching and, ideally, would eliminate random firearm use. This is perhaps the single most important mitigation for wildlife (HDR, 1980a). Funding of additional personnel to enforce game laws would also help reduce impacts (Ball, 1981).

4.2.4 <u>Vegetation Mitigations</u>

Perhaps the most basic mitigation in prevention of vegetation loss is the implementation of construction plans that will localize and minimize disturbance and that provide for revegetation of large heavily disturbed areas where possible.

Proposed mitigation is to limit construction equipment, and off-road parking and driving to the small areas designated for construction disturbance.

Artificial revegetation can be very complex, and limiting the extent of plant loss to reduce the need for revegetation is an important mitigation measure. Revegetation techniques differ for each vegetation type. Research has shown seeding and transplanting of shrubs have often failed due to poor germination, poor growing conditions, grazing by rodents, and inadequate soil preparation (Graves, 1976). Difficulties in restoration may also be encountered unless plant stock, seed, or transplant material come from a given site (Plummer and others 1955 and 1968).

Attempts at restoration must also consider abiotic factors. Disturbance that destroys the soil restricts restoration of vegetation since nutrient availability is a limiting factor in desert regions (James and Jurinak, 1978).

Factors such as soil salinity must be considered. Great Basin and Mohave perennial plant species have been tested for salt tolerance by growing seedlings and rooted cuttings on soils of increasing salinity (Romney and others, 1972). Results show that different species have different tolerances to salinity: *Atriplex canescens* and *Atriplex hymenelytra* can survive very high salinity conditions; *Ambrosia dumosa*, *Larrea divaricata*, and *Yucca schedigera* tolerate moderate salt levels; *Artemisia tridentata* and *Artemisia spinescens* are salt sensitive but not

as highly sensitive as Coleogyne ramosissima, Dalea fremontii, Ephedra viridis, Grayia spinosa, and Lycium andersonii. Therefore, selection of appropriate native species for revegetation must consider the abiotic conditions of the area as well as the suitability of individual species.

Several pioneer species can grow in disturbed soil low in organic matter (El-Ghonemy and others, 1980). The use of such pioneer species as Atriplex confertifolia can provide a successional stage in the revegetation process.

Plans should also be implemented to prevent commercial exploitation or poaching of unique vegetation such as cacti and yucca.

5.0 CONCLUSIONS

5.1 SURVEY RESULTS: SPECIES AND AREAS OF BIOLOGICAL CONCERN

A review of existing information revealed that no threatened or endangered plant species were known from the Dry Lake Valley study area. However, at least two species of plants identified during the fall 1980 field survey are on the Northern Nevada Native Plant Society list as threatened species and on the Federal list as Taxa Currently Under Review. Scattered individuals of *Coryphantha vivipara* and *Sclerocactus pubispinus* were observed within the valley. *Sclerocactus* was observed as a single individual, although it is known to exist in other valleys in large populations. *Coryphantha* was observed in groups of one to four individuals. The variety of this species is thought to be *rosea*, but positive identification could not be determined due to the season of the survey. Because the species of several plants could not be identified, a spring survey was planned. The results of this spring 1981 field survey are covered in a supplement to this report.

A number of other plant genera were observed that may be species currently listed in the Federal Register or currently under review for possible listing, although positive species identification was impossible during the season of the survey due to the lack of flowers and reproductive structures. These genera include *Eriogonum*, *Castilleja*, *Gilia*, *Astragalus*, *Opuntia*, *Lepidium*, *Erigeron*, *Senecio*, *Cryptantha*, *Machaeranthera*, *Haplopappus*, *Camissonia*, *Sphaeralcea*, *Mentzelia*, *Oenothera*, and *Lupinus*.

Gutierrezia sarothrae, Machaeranthera canescens, Astragalus lentiginosus, Lepidium montanum, and Eriogonum microthecum were also observed, but again, the variety could not be determined due to the season of the survey. Echinocereus engelmannii was also observed, but it was not the endangered variety purpureus. With the exception of Astragalus sp. , Eriogonum sp., and Penstemon sp., it is very unlikely that most of these are listed individuals, as many of those are generally known only from specific habitats not found in the Dry Lake area or are known only from distant or out of state areas. While this does not preclude their presence in Dry Lake, it seems unlikely that most of the Dry Lake plants are the same variety. The endangered variety of Macharanthera canescens, for example, is known only from western California; the endangered varieties of Lepidium montanum have been found only in Utah, one known only from a single mountain ridge, the other known only from shale outcrops in Kane County. The varieties of Eriogonum microthecum are known only from California and Gutierrezia sarothrae only from Utah.

Dry Lake Valley appears to have few key-use areas for particular wildlife species or special habitats for plants. The Nevada Department of Wildlife considers riparian and wetland areas, sage grouse strutting grounds, caliche washes providing tortoise habitat, antelope kidding areas, and spring and winter mule deer range as critical or sensitive habitat (Molini, 1980). The Dry Lake study area has no sage grouse or tortoise usage and little or no riparian or wetland area.

The northeastern portion of the valley lies within winter mule deer range, an important forage area during this portion of the year. Shelters 12, 14, and 16 through 23 of Cluster 8, and the eastern half of Cluster 9, all lie within this range. The field survey showed evidence of mule deer at only three shelter sites. However, it is likely that a survey made in winter or early spring, rather than the fall, would indicate additional use of the area by mule deer. Presence of a possible migration route crossing the northern portion of the study area has been suspected. The field survey provided no additional evidence of this, but that may be due to the season the survey was conducted.

Nearly the entire study area has potential as antelope habitat, but, with one exception, antelope sign was confined to the northern half of the study area. Evidence of heavy cattle grazing was observed in the southern part of the valley, and this competition between species may account for the apparent lack of antelope use there.

A number of raptors and other federally protected birds, including the golden eagle, use the study area to forage. Although they nest in the mountains, any major impacts on the prey base will affect these raptor populations.

A large portion of raptor prey consists of small mammals. The number of small mammal populations is therefore one indication of whether or not an area provides suitable raptor habitat. Although some trapping was made to ascertain typical rodent

species present, it was not within the scope of this project to evaluate the small mammal populations of the valley in this manner.

5.2 EVALUATION OF PROCEDURES

5.2.1 Evaluation of General Approach

The IOC valleys are considered as test valleys to develop biological survey procedures for use in other MX deployment areas. During the IOC survey, several factors have become apparent. First, and perhaps most important, is that a valley cannot be viewed as a series of discrete, noninteracting units for which mitigation can be accomplished on a site-by-site basis. Moving a shelter a few hundred feet may be sufficient to mitigate for a sessile organism, such as an endangered plant, but it is inadequate for the larger, motile members of the community whose critical habitat encompasses a large area. For example, there is a recommended 1.8-mile (3-km) buffer zone around sage grouse strutting grounds (Day, 1980; and Braun, 1977). Raptors may abandon their nests due to activity occurring as far as a quarter mile away (White, 1981). In cases such as these, minor rearrangement of shelter sites is of little value, and elimination of the shelter site may be the only effective mitigation.

One way to avoid this type of conflict is to consider species ranges, critical habitat, and other factors in developing site layouts. While it would not be feasible to collect site-specific data for the shelter sites during layout, the IOC program has shown that it is possible to obtain data describing

the entire valley ecosystem. Information from the IOC survey indicates that the literature and data search may be used as a predictive tool to provide general information on species ranges and populations within a valley. Sufficient background data were obtained from files of BLM and wildlife offices to pinpoint most major biological conflicts expected to occur. Therefore, these data can be used during the layout procedure to address potential biological conflicts and mitigate impacts on migration routes, critical habitats, breeding grounds, and other significant areas for which resiting of individual shelters is insufficient.

In addition to consideration of species and habitat on the valley floor in developing layouts, species in adjacent foothill and mountain areas also need to be considered. For example, raptors nesting in mountains surrounding Dry Lake Valley use the valley floor for hunting. Mule deer or sheep that normally are not found on valley floors may seasonally migrate through the area. Species other than those considered threatened, endangered, or protected should also be considered during the layout procedures. Without consideration of common species that have an important role in supporting the ecosystem, a valley ecosystem could become disrupted, adversly affecting many species including already threatened, endangered, or protected species, and may result in adding additional species to these categories.

Ideally, the entire MX system should be considered in any evaluation of biological impacts because the value of a particular

resource is related to its abundance and distribution. One small population may have relatively little value if there are o+her large populations in the vicinity; it may assume greater importance as total numbers or range decrease. Various parts of the MX project have a cumulative and interactive effect; individual valleys should not be considered as separate projects merely because of their diverse locations.

Evaluating the MX system on a valley-by-valley basis cannot indicate the magnitude of total impact on most populations. Only when the effects on a species are known over its entire range can the true impact be evaluated. For this reason, it would be desirable to consider large areas, as opposed to single valleys, during layout evaluation.

At the beginning of the IOC biological survey program, it was believed that survey data from one valley might be used as a predictive model for other valleys. On a species-specific level, this has not proven to be true; biological resources vary too greatly from area to area. Two adjacent IOC valleys in Utah (discussed in Volume II, Part II) were shown to be quite different biologically, and they both differ substantially from Dry Lake Valley. In addition, a species of little consequence in one area may, under different conditions, be of greater importance elsewhere.

5.2.2 Evaluation of Field Procedures

Field surveys tended to corroborate the data obtained from the literature, as well as provide specific, on-site information.

Many of the MX valleys have never been given serious scientific study, and the MX field data will provide a great deal of new biological information that will further understanding of valley ecosystems.

Procedures as described in Section 2.0 were found adequate, and no major changes are felt to be necessary. A few minor changes, however, will help to increase efficiency during the field sessions.

The biological survey should be conducted in spring and summer whenever possible because most annual plant species are not in flower and, therefore, are not identifiable during fall and winter. Since many threatened and endangered species are annual plants, surveys made during non-flowering months cannot be considered complete. Even a year-round investigation might not be sufficient to inventory all plant species, because new individuals do not enter the system each year but are present only in years when rainfall is sufficient for germination and seedling survival (Wallace, et al., 1980; Beatley, 1974b). One study in Rock Valley, Nevada, showed that only two years between 1963 and 1969 were actually conducive to new seedling establishment. Other annuals restrict germination to years with minimum precipitation levels.

Likewise, an inventory of wildlife over a single season will not be complete because many animals migrate or hibernate during the fall and winter.

The survey itself produced some minimal, but for the most part unavoidable, damage to the valley. Field crews limited off-road travel as much as possible to avoid damage to existing vegetation, and they followed tracks of the surveyors to the sites whenever possible. It was necessary to drive into a new area in only a few instances when surveyors tracks could not be located.

The survey has pointed out the need to clarify the guidelines for site relocation for biological resources. Relocation for a listed threatened or endangered species may satisfy legal requirements, but relocation is not legally required for game species and other sensitive, but not federally listed, plants and animals. Two endangered species may vary in their degree of "endangeredness." Moving a shelter site for one or two individuals may be justified for one species but not for another, and the distance of relocation necessary may vary depending on the species.

For these reasons, rigid criteria should be avoided in relocation procedures. Project impacts on each species should be evaluated on a case-by-case basis. The role of the species in the ecosystem, the range and size of the population, its ability to adapt to change or move to other habitats, and its possible interactions with man should all be considered.

However, it would be desirable to establish a few basic resiting guidelines which are mutually agreeable to all agencies concerned. Biological concerns differ widely, depending upon

the species affected. To provide guidelines for relocation, state agency experts familiar with the species in question should be consulted. These experts could provide input as to desirable avoidance distances and possible mitigation methods. If these biological impacts and concerns are then evaluated and incorporated early in the layout procedure, this will probably eliminate the need for most major biological relocations involving "gray areas" such as impacts on game species ranges, important migration routes, or breeding areas. Biological conflicts discovered during the field survey will likely be sufficiently minor that shelter relocation will provide adequate mitigation. With the exception of the layout evaluation, this is essentially the method used in the IOC valleys, as discussed in Section 3.3.

6.0 BIBLIOGRAPHY

Ayensu, E. S., and DeFilipps, R. A., 1978, Endangered and threatened plants of the United States, The Smithsonian Institution and the World Wildlife Fund, Inc., Washington, D.C.

Ball, T., 1981, Biologist, Cedar City BLM District Office, Personal communication, 5 and 23 February.

Beale, D. M., and Smith, A. D., 1973, Mortality of pronghorn antelope fawns in Western Utah, Reprinted from The Journal of Wildlife Management, v. 37, no. 3, p. 343-352.

Beatley, J. C., 1965, Effects of radioactive and non-radioactive dust upon Larrea divaricata cav., Nevada Test Site, Health Physics, v. II, p. 1621-1625.

_____, 1967, Survival of winter annuals in the northern Mojave Desert, Ecology, v. 48, p. 745-750.

_____, 1969a, Biomass of desert winter annual populations in southern Nevada, Oikos, v. 20, p. 261-273.

_____, 1969b, Dependence of desert rodents on winter annuals and precipitation, Ecology, v. 50, p. 721-724.

_____, 1974a, Effects of rainfall and temperature on the distribution and behavior of Larrea tridentata (creosote bush) in the Mojave Desert of Nevada, Ecology, v. 55, p. 245-261.

_____, 1974b, Phenological events and their environmental triggers in Mojave Desert ecosystems, Ecology, v. 55, p. 856-863.

_____, 1975, Climates and vegetation patterns across the Mojave/Great Basin desert transition of southern Nevada, American Midland Naturalist, v. 93, p. 53-70.

_____, 1976, Vascular plants of the Nevada Test Site and central-southern Nevada - ecological and geographic distributions, ERDA publication: TID-26881.

Benedict, H. M., 1970, Economic impacts of air pollutants on plants, Stanford Research Institute, Irvine, California, and National Technical Information Service, U.S. Department of Commerce.

Billings, W. D., 1949, The shadscale vegetation zone of Nevada and eastern California in relation to climate and soils, American Midland Naturalist, v. 42, p. 87-109.

Billings, W. D., 1951, Vegetation zonation in the Great Basin of western North America, in Les bases ecologeques de la regeneration de la vegetation des zones arides, Internation Union of Biological Sciences, Series B, no. 9, p. 101-122.

______, 1954, Environmental studies in the cold deserts and semi-deserts of the western Great Basin of North America, Quartermaster Research and Development Command, United States Army, Report Contract DA 44-109-gm-1261.

Brady, N. C., 1974, The nature and property of soils, New York: Macmillan Publishing Company.

Braun, C. E., and others, 1977, The guidelines for maintenance of sage grouse habitats, The Wildlife Society Bulletin, v. 5, no. 3, p. 99-106.

Bury, R. B., and others, 1977, Effects of off-road vehicles on vertebrates in the California desert, U.S. Fish and Wildlife Service, Wildlife Research Report 8.

Bussack, S. D., and Bury, R. B., 1974, Some effects of off-road vehicles and sheep grazing on lizard populations in the Mojave Desert, Biological Conservation, v. 6, p. 179-183.

Canfield, R. H., 1941, Application of the line intercept method in sampling range vegetation, Journal of Forestry, v. 34, p. 388-394.

Carter, L. J., 1974, Off road vehicles: a compromise plan for the California desert, Science, v. 183, p. 396-398.

Charley, J. L., 1972, The role of shrubs in nutrient cycling, in McKell, C.M., and others, eds., Wildland shrubs -- their biology and utilization, U.S. Forest Service Technical Report 1-N8-1.

Charley, J. L., and West, N. E., 1975, Plant-induced soil chemical patterns in some shrub-dominated semi-desert ecosystems of Utah, Journal of Ecology, v. 63, p. 945-963.

Chew, R. M., and Chew, A. E., 1969, Reproduction in the psammophilous lizard *Uma scoparia*, Copeia, v. 1966, p. 114-122.

______, 1970, Energy relationships of the mammals of a desert shrub (*Larrea tridentata*) community, Ecological Monograms, V. 40, p. 1-21.

Cleaves, D. T., and Taylor, J., 1979, Competition as a control of *Halogeton glomeratus*, Journal of Colorado-Wyoming Academy of Sciences, v. 40, no. 1, p. 18.

Collopy, M. W., 1978, The bioenergetic requirements for growth and maintenance of raptors common to the Snake River birds of prey natural area, Bureau of Land Management, Idaho, Contract final report, USDI.

Cook, C. W., and Stoddart, L. A., 1953, The halogeton problem in Utah, Agricultural Experiment Station, Utah State Agricultural College Bulletin, v. 364, p. 1-44.

Cottam, W. P., 1961, Our renewable wild lands -- a challenge, Salt Lake City, Utah: University of Utah Press.

Cronin, E. H., 1973, Pregermination treatment of black seed of halogeton, Weed Science, v. 21, no. 2, p. 125-127.

Cronquist, A., and others, 1972, Intermountain flora-vascular plants of the intermountain west; Hafner Publishing Company, v. I.

Daubenmire, R. F., 1974, Plants and environment - a textbook of autecology, 3rd edition, New York: John Wiley and Sons.

Davidson, E., and Fox, M., 1974, Effects of off-road motorcycle activity on Mojave Desert vegetation and soil, Madrono, v. 22, p. 381-390.

Day, D., 1980, Director, Utah Division of Wildlife Resources, Personal communication, 15 December.

Eakin, 1963, MX siting investigations geotechnical summary water resource program, FY 79, p. 38-42.

______, 1964, Groundwater appraisal of the Coyote Spring and Kane Spring Valleys and Muddy River Springs Area, Lincoln and Clark Counties, Nevada, Groundwater Resources - Reconnaissance Series Report 25, State of Nevada Department of Conservation and Natural Resources.

______, 1966, A regional interbasin ground water system in the White River Area, southeastern Nevada, Water Resource Bulletin no. 33, Nevada Department of Conservation and Natural Resources.

Eakin, Thomas E., and Moore, Donald O., 1964, Uniformity of discharge of Muddy River Springs, Southeastern Nevada, and relation to interbasin movement of ground water, Carson City, Nevada, U.S. Geological Survey Professional Paper 501-D, p. D171-D176.

Eckert, R. F., Jr., and Kinsinger, F. E., 1960, Effects of Halogeton glomeratus leachate on chemical and physical characteristics of soils, Ecology, v. 41, no. 4, p. 764-772.

Eckert, R. F., and others, 1976, Properties, occurrence and management of soils with vesicular surface horizons, Progress report of Nevada Agricultural Experiment Station to BLM, 31 January, p. 40.

Egoscue, Harold J., 1956, Preliminary studies of the kit fox in Utah, Journal of Mammalogy, v. 37, p. 351-357.

_____, 1962, Ecology and life history of the kit fox in Tooele County, Utah, Ecology, v. 43, p. 481-497.

El-Ghonemy, A. A., and others, 1980a, Frequency distribution of numbers of perennial shrubs in the northern Mohave Desert, Great Basin Memoirs, v. 4, p. 34-38.

_____, 1980b, Socioecological and soil-plant studies of the natural vegetation in the northern Mohave Desert-Great Basin interface, Great Basin Naturalist Memoirs, v. 4, p. 73-88.

Elton, C. S., 1927, Animal ecology, London: Sidgwick and Jackson.

Evans, R. A., and others, 1967, Wheatgrass establishment with paraquat and tillage on downy brome ranges, Weeds, v. 15, p. 50-55.

Farrens, P. J., 1975, How recreation land developments affect local vegetation, a predictive model, M.S. Thesis, Reno, Nevada: University of Nevada.

Federal Register, 1980, v. 45, no. 242, p. 82480-82569.

Federal Register, 1980, v. 45, no. 99, p. 33768-33781.

Federal Register, 1979, v. 41, no. 110, p. 222915-222922.

Foster, R. H., 1968, Distribution of the major plant communities in Utah, Ph.D. Dissertation, Provo, Utah: Brigham Young University.

Fugro National Inc., (no date), MX siting investigations geotechnical summary water resource program, FY 79.

Garcia-Moya, E., and McKell, C. M., 1970, Contribution of shrubs to the nitrogen economy of a desert-wash plant community, Ecology, v. 51, p. 81-88.

Gates, D. H., and others, 1956, Soil as a factor influencing plant distribution on salt-deserts of Utah, Ecological Monographs, v. 16, no. 2, p. 155-175.

Goodall, D. W., and Morgan, S. J., 1974, Seed reserves in desert soils, US/IBP Desert Biome Research Memorandum 74-16.

Gore, J., 1981, U.S. Fish and Wildlife Service, Boise, Idaho, Personal communication.

Graham, E. H., 1937, Botanical studies in the Uinta Basin of Utah and Colorado, Annals of the Carnegie Museum, v. 26, p. 1-432.

Graves, W., 1976, Revegetation of disturbed sites with native shrub species in the western Mojave Desert, in Kay, B.L., ed., 1976, Test of seeds of Mohave Desert shrubs, Department of Agronomy and Range Science, University of California, Davis, California, Progress Report, BLM Contract No. 53500-(T4-21N).

Hammond, P. B., and Aronson, A. L., 1964, Lead poisoning in cattle and horses in the vicinity of a smelter, Annals of the New York Academy of Sciences 111, p. 595-611.

Harris, L. D., 1971, Small mammal studies and results in the grassland biome, in French, N. R., ed., Preliminary analysis of structure and function in grasslands, Colorado State University, Fort Collins, Range Science Department, Science Series no. 10, p. 213-240.

Harrison, B. F., 1980, Botanical survey threatened, endangered and other rare plants of the Schell Resource area, Ely District, Nevada, BLM, Intermountain Research Corporation, Provo, Utah.

HDR Sciences, 1979, An evaluation of environmental resources of Dry Lake Valley, Delamar Valley, Tikaboo Valley, and Penoyer Valley, Lincoln County, and Big Smoky Valley, Esmeralda County, Nevada, p. 5-21.

_____, 1980a, Environmental impact analysis process, deployment area selection and land withdrawal/acquisition DEIS: Chapter 1 (Program Overview); Chapter 2 (Comparative Analysis of Alternatives): Chapter 3 (Affected Environments); Chapter 4 (Environmental consequences of the study regions and operating base vicinities); Chapter 5 (Appendices).

_____, 1980b, Unpublished data.

_____, (no date), Environmental characteristics of alternative designated deployment areas: protected species, Environmental Technical Report 17.

Herron, G., 1980, Non-game biologist, Nevada Department of Wildlife, Personal communication.

Hinman, Robert A., 1958, Antelope populations in southwestern Utah with special reference to golden eagle predation, Completion report for Federal Aid Project W-65-R-6, Utah State Department of Fish and Game.

Hitchcock, and others, 1964, Vascular plants of the Pacific Northwest: Seattle, Washington: University of Washington Press, v. 2.

_____, 1969, v. 1.

Hodder, R. L., 1977, Dry land techniques in the semi-arid west in Thames, J.L., ed., Reclamation and use of disturbed land in the southwest, Tucson, Arizona: University of Arizona Press, p. 217-224.

Hohn, J., 1981, U.S. Fish and Wildlife Service, Portland, Oregon, Personal communication, 26 February.

Holland, J. S., and Schramm, D. R., 1977, Cacti of southern Nevada, Las Vegas, Nevada: University of Nevada.

Holmgren, R. C., and Hutchings, S. S., 1972, Salt desert shrub response to grazing use, in McKell, C.M., and others, eds., Wildland shrubs -- their biology and utilization, U.S. Department of Agriculture, Forest Service, General Technical Report INT-1.

Howard, G. S., and Samuel, M. J., 1979, The value of fresh-striped topsoil as a source of useful plants for surface mine revegetation, Journal of Range Management, v. 32, no. 1, p. 76-77.

Hunter, and others, 1975, Responses and interactions in desert plants as influenced by irrigation and nitrogen applications, US/IBP Desert Biome Research Memorandum RM 73-26.

Irvine, J. R., and West, N. E., 1979, Riparian tree species distribution and succession along the lower Escalante River, Utah, The Southwestern Naturalist, v. 24, p. 331-346.

Jaeger, E. C., 1972, Desert wild flowers, Standford, California: Stanford University Press.

James, Lynn F., and Cronin, Eugene H., 1974, Management practices to minimize death losses of sheep grazing Halogeton-infested range, Journal of Wildlife Management, v. 27, no. 6, p. 424-426.

James, D. W., and Jurinak, J. J., 1978, Nitrogen fertilization of dominant plants in the northeastern Great Basin Desert in Nitrogen Desert Ecosystems, West, N. E. and Skufins, J. eds., Dowden, Stroudsburg, Pennsylvania: Hutchinson and Ross, Inc.

Jarvis, Joseph M., 1969, Ecological effects of marsh manipulation by drawdown and mechanical removal of vegetation, M.S. Thesis, Irvine California: Humbolt State College.

Jaynes, R. A., and Harper, K. T., 1978, Patterns of natural revegetation in arid southeastern Utah, Journal of Range Management, v. 31, p. 407-411.

Johnson, H. B., and others, 1975, Productivity, diversity, and stability relationships in Mojave Desert roadside vegetation, Bulletin of the Torrey Botany Club, v. 102, p. 106-115.

Kinsinger, Floyd E., and Eckert, Richard E., 1961, Emergence and growth of annual and perennial grasses and forbs in soils altered by Halogeton leachate, Journal of Range Management, v. 14, p. 194-197.

Krueger, William C., and Sharp, Lee A., 1978, Management approaches to reduce livestock losses from poisonous plants on rangeland, Journal of Range Management, v. 31, no. 5, p. 347-350.

Lee, Ronald, 1981, Game biologist, Nevada Department of Wildlife, Personal communication, 23 February.

Low, W. A., 1979, Spatial and temporal distribution and behaviour, in Arid-land ecosystems, Goodall, D.W., and Perry, R.A., eds., Cambridge, Massachusetts: Cambridge University Press, v. I, p. 769-795.

Luckenbach, Roger A., 1975, What the off-road vehicles are doing in the desert, Fremontia, v. 2, p. 3-11.

McQuivey, Robert P., 1976, The status and trend of desert bighorn sheep, Federal aid in Wildlife Restoration, Project W-48-8, Study R-III, Job I, Reno, Nevada: Nevada Department of Fish and Game, Special Report 77-6.

______, 1978, The desert bighorn sheep of Nevada, Nevada Department of Wildlife, Final Report, Federal aid in Wildlife Restoration, Project W-48-R-8, Study R-III, Reno, Nevada. Biological Bulletin no. 6.

Martin Marietta, 1980, Special interest flora and fauna of Nevada: assembly test and system support, MX program, Denver, Colorado, ST-0080/F04704-78-C-0016.

Mayhew, W. W., 1966, Reproduction in the arenicolous lizard Uta notata, Ecology, v. 47, p. 9-18.

Miller, Keith, 1956, Control of Halogeton in Nevada by range seeding and herbicides, Journal of Range Management, v. 9, p. 227-229.

Millsap, B., 1981, Bureau of Land Management, Phoenix, Arizona, Personal communication, 30 January.

Molini, William A., 1979, Nevada bobcat population status report, Nevada Department of Wildlife, submitted to ESSA.

_____, 1980, Personal communication, 27 August.

_____, 1981, Personal communication.

Murie, O. J., 1974, A field guide to animal tracks, 2nd edition, Boston, Massachusetts: Houghton Mifflin Company.

Murphy, J. A. and White, C. M., 1980, Raptor surveys in the intermontance valleys of western Utah and eastern Nevada, Final Report to HDR.

Murphy, J. R., 1975, Status of golden eagle populations in Central Utah, in Murphy, J. R., and others, eds., Population status of raptors, Proceedings of conference on raptor consideration, Technical raptor research report no. 3.

National Academy of Sciences, 1974, Rehabilitation potential of western coal lands, Cambridge Massachusetts: Bollinger Publishing Company.

Nelson, J. F., and Chew, R. M., 1979, Factors affecting seed reserves in the soil of a Mojave Desert ecosystem, Rock Valley, Nye County, Nevada, American Midland Naturalist, v. 97, no. 2, p. 300-320.

Nevada Revised Statutes, Protection of trees and flora, Statutes 527.260-527.300.

Nevada Department of Wildlife, 1980, maps.

Nevada State Engineers Office, 1971, Water for Nevada: Nevada's water resources, Report no. 3.

_____, 1973, Water for Nevada: forecasts for the future - fish and wildlife, Report no. 6.

Nielson, Darwin B., 1978, The economic impact of poisonous plants on the range livestock industry in the 17 western states, Journal of Range Management, v. 31, no. 5, p. 325-328.

Paulsen, H. A., 1953, A comparison of surface soil properties under mesquite and perennial grass, Ecology, v. 34, p. 727-732.

Piemeisel, R. L., 1932, Weedy abandoned lands and weed hosts of the beat leaf hopper, U.S. Department of Agriculture Circular 229.

Piemeisel, R. L., 1938, Changes in weedy plant cover on cleared sagebrush land and their probable causes, U.S. Department of Agriculture Technical Bulletin 654.

Pinzl, Ann, 1979, Nevada's threatened and endangered plant map book, Nevada State Museum, Carson City, Nevada.

_____, 1980, Nevada threatened and endangered plant map book, Nevada State Museum, Carson City, Nevada.

Plummer, and others, 1955, Seeding rangelands in Utah, Nevada, southern Idaho, and western Wyoming, U.S. Department of Agriculture Handbook 71.

_____, 1968, Restoring big game range in Utah, Utah Division of Fish and Game, Publication no. 68-3.

Reinking, R. F., and others, 1975, Dust storms due to the dessication of Owen's Lake, Proceedings--International Conference on Environmental Sensing and Assessment, Las Vegas, Nevada, 14-19 September.

Rickard, W. H., 1965, The influence of greasewood on soil moisture and soil chemistry, Northwest Science, v. 39, p. 36-42.

Riechert, S. E., 1979, Development and reproduction in desert animals, in Arid-land ecosystems, Goodall, D. W., and Perry, R. A., eds., Cambridge, Massachusetts: Cambridge University Press, v. I, p. 797-822.

Roberts, R. C., 1950, Chemical effects of salt-tolerant shrubs on soils, Proceedings of the Fourth International Congress of Soil Scientists, v. I, p. 404-406.

Robertson, J. E., and others, 1966, Responses to grasses seeded in an Artemisia tridentata habitat in Nevada, Ecology, v. 47, p. 187-194.

Robinson, Scott, 1980, District Biologist, Ely District Bureau of Land Management Office, Nevada, Personal communication.

Romney, E. M., 1973, Some characteristics of soil and perennial vegetation in northern Mojave Desert areas of the Nevada test site, U.S. Atomic Energy Commission Report no. UCLA 12-916.

Romney, E. M., and others, 1977a, Effects of shrubs on redistribution of minerals nutrients in zones near roots in the Mojave Desert, in Marshall, J. K., ed., 1977, Proceedings of below ground ecosystem symposium, Fort Collins, Colorado: a synthesis of plant-associated processes, Range Science Department, Science Series no. 26.

Romney, E. M., and others, 1977b, Plant response to nitrogen fertilization in the northern Mohave Desert and its relationship with water manipulation, in West, N. E., and Skufins, J., eds., 1977, Nitrogen processes in desert ecosystems, Stroudsburg, Pennsylvania: Dowden, Hutchinson and Ross.

_____, (no date), The pulse hypothesis in the establishment of Artemisia seedlings at Pahute Mesa, Nevada, Great Basin Naturalist Memorandum, v. 4, p. 26-28.

Romney, E. M., and Wallace, A., 1972, Radioecology and ecophysiology of desert plants at the Nevada test site, USAEC, TID-25954.

Ryser, F., 1976, Check list of the birds of Nevada, University of Nevada, Reno.

Sandoval, F. M., and Power, J. F., 1977, Laboratory methods recommended for chemical analysis of mined-land spoils and over-burden in western United States, U.S. Government Printing Office, Washington, D.C., U.S. Department of Agriculture Handbook 525.

Shields, L. M., and Wells, P. V., 1963, Recovery of vegetation in the vicinity of atomic target areas at the Nevada test site in Proceedings of the first national symposium on radio-ecology, New York: Reinhold Publishing Corporation, p. 307-310.

Shreve, F., 1917, The establishment of desert perennials, Journal of Ecology, v. 5, p. 210-216.

Shreve, F., and Minckeley, A. L., 1937, Thirty years of change in desert vegetation, Ecology, v. 18, p. 463-478.

Smith, R. L., 1974, Ecology and field biology, New York: Harper & Row Publishers.

Snyder, N. F. R., and Snyder, H. A., 1975, Raptors in range habitat, in Proceedings of the symposium on management of forest and range habitats for non-game birds, Smith, D. R., Coordinator, U.S. Department of Agriculture, Forest Service, General Technical Report WO-1.

_____, and Board of Fish and Game Commissioners, 1978, Commission General Regulations, no. 1, p. 8.

Stebbins, R. C., 1954, Amphibians and reptiles of western North America, New York: McGraw-Hill Book Company.

_____, 1966, A field guide to western reptiles and amphibians, Boston, Massachusetts: Houghton Mifflin Company.

Stevens, R., and others, 1977, Winterfat (Ceratoides lanata), Utah Division of Wildlife Resources.

Stewart, G., and others, 1940, Influence of unrestricted grazing on northern salt desert plant associations in western Utah, Journal of Agricultural Research, v. 60, p. 289-316.

Strickler, G. S., and Sterns, F. W., 1963, The determination of plant density, U.S. Department of Agriculture, Miscellaneous Publication 940.30-39.

Sundstrom, Charles, and others, 1973, Abundance, distribution and food habits of the pronghorn, a partial characterization of the optimum pronghorn habitat, Cheyenne, Wyoming, Wyoming Game and Fish Commission Bulletin no. 12.

Taylor, S. A., and Ashcroft, G. L., 1972, Physical edaphology, San Francisco, California: W. H. Freeman and Company.

Tiedemann, A. R., and Klemmedson, J. D., 1973, Effects of mesquite on physical and chemical properties of the soil, Journal of Range Management, v. 26, p. 27-29.

Tschanz, C. M., and Pampeyan, 1970, Geology and mineral deposits of Lincoln County, Nevada, Nevada Bureau of Mines Bulletin 73.

Tueller, P. T., 1979, Food habits and nutrition of mule deer on Nevada ranges, Final Report, Federal Aid in Wildlife Restoration, Nevada Department of Fish and Game, and Nevada Agricultural Experiment Station, Project W-48-5, study 1, job 2.

Turner, and others, 1973, Reproduction and survivorship of the lizard Uta stansburiana, and the effects of winter rainfall, density and predation on these processes, U.S. International Biological Program, Desert Biome Research Memorandum RM-73-26.

Udvardy, M. D., 1977, The Audubon Society field guide to North American birds, western region, New York: Alfred A. Knopf.

Udy, J. R., 1953, Effects of predator control on antelope populations, Federal Aid Division, U.S. Department of Fish and Game, Printed by the Utah State Department of Fish and Game, Publication no. 5.

(U.S.) Department of Agriculture, 1965, Improving cattle distribution on western mountain rangelands, Farmers Bulletin no. 2212, Washington, D.C.

(U.S.) Department of Commerce, 1975, Climatological data annual summary, v. 90, no. 13.

U.S. Department of Commerce, 1977, Climatological data annual summary, v. 92, no. 13.

_____, 1979, v. 94, no. 13.

(U.S.) Department of the Interior, 1979a, Final environmental impact statement on grazing management in the East Roswell ES Area, Bureau of Land Management, Washington, D.C.

_____, 1979b, Ely District Office, Wildlife sighted or trapped in Dry Lake Valley.

_____, 1980a, Bureau of Land Management, Washington, D.C., Instruction Memorandum no. 80-722.

_____, 1980b, Caliente District Office, Caliente URA-threatened or endangered plant species.

_____, 1980c, Nevada State Office, 1980 Nevada progress report, Reno, Nevada.

(U.S.) Department of the Interior, Bureau of Land Management, and United States Department of Agriculture, Forest Service, 1980, Administration of the wild, free-roaming horse and burro act, United States Government Printing Office, Washington, D.C., Third report to congress: 1980 0-329-244.

(U.S.) Environmental Protection Agency, 1973, Processes, procedures, and methods to control pollution resulting from all construction activity, Office of Air and Water Programs, Washington, D.C., EPA 430/9-73-007.

(U.S.) Fish and Wildlife Service, 1980, Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species, Notice of review, 50CFR17, Federal Register, v. 45, no. 242.

Van De Graaf, K. M., and Balda, R. P., 1973, Importance of green vegetation for reproduction in the kangaroo rat, *Dipodomys merriami merriami*, Journal of Mammology, v. 54, p. 509-512.

Van Dyne, G. M., 1960, A procedure for rapid collection, processing, and analysis of line intercept data, Journal of Range Management, v. 13, p. 247-251.

Wallace, A., and Romney, E. M., 1972, Some effects of an artificial stream on desert vegetation, *in* Radioecology and ecophysiology of desert plants at the Nevada test site, U.S. Atomic Energy Commission Office of Information Services, IID-25954.

Wallace, A., and others, 1977, Nitrogen cycle in the northern Mojave Desert: implications and predictions, in US/IBP Synthesis Series 9, Stroudsburg, Pennsylvania: Dowden, Hutchinson, and Ross, Inc., p. 207-218.

Wallace, A., and others, 1980, The challenge of a desert: revegetation of disturbed desert land, Great Basin Naturalist Memorandum, v. 4, p. 214-225.

Walstrom, Robert E., 1973, Water for Nevada, Forecasts for the future - fish and wildlife, Nevada State Engineer's Office, Report no. 6.

Webb, R. H., and others, 1976, Environmental effects of soil property changes with off-road vehicle use, Environmental Management, v. 2, p. 219-223.

Wells, P. V., 1961, Succession in desert vegetation on streets in Nevada ghost town, Science, v. 134, p. 670-671.

Welsh, Stanley, L., and Neese, Elizabeth, 1980, Rare and endangered plant investigations in Nevada and Utah, Draft final report, Prepared for Henningson, Durham and Richardson (HDR).

Welsh, Stanley L., and others, 1975, Endangered, threatened, extinct, endemic, and rare or restricted Utah vascular plants, Great Basin Naturalist, v. 35, p. 4.

Wilshire, H. G. and Nakata, J. K., 1976, Offroad vehicle effects on California's Mojave Desert: California Geology, v. 29, p. 123-130.

White, C. M., 1980, Personal communication, 27 August.

______, 1981, Second Klamath Bald Eagle Conference, 15-17 February.

White, C. M., and others, 1979, Effects of controlled disturbances on ferruginous hawks as may occur during geothermal energy development, Geothermal Resources Council, Transactions, v. 3.

Woffinden, N. D., and Murphy, J. R., 1977, Population dynamics of the ferruginous hawk during a prey decline, Great Basin Naturalist, v. 37, p. 411-425.

Wood, K. M., and others, 1976, Spiny hopsage germination, Journal of Range Management, v. 27, no. 7, p. 53-56.

Woody, J. R., and Thomas, B. O., 1968, Study of certain meteorological influences on the emergences and breeding of the plains spadefoot toad (Scaphiopus bombifrons), Journal of Colorado-Wyoming Academic Science, v. 6, no. 1, p. 11.

Yoakum, J. D., 1968, Pronghorn in Schidt, J. L., and Gilbert, D. L., eds., Harrisburg, Pennsylvania: Stackpole Books.

Young, J. A., and others, 1972, Alien plants in the Great Basin, Journal of Range Management, v. 25, p. 194-201.

Young, J. A., and Evans, R. A., 1973, Downybrome - intruder in plant succession of big sagebrush communities in the great basin, Journal of Range Management, v. 26, p. 410-415.

_____, 1974, Population dynamics of green rabbitbrush communities, *Journal* of Range Management, v. 27, no. 2, p. 127-132.

APPENDIX A

FEDERAL REGISTER LISTING AND GUIDELINES

82480 Federal Register / Vol. 45, No. 242 / Monday, December 15, 1980 / Proposed Rules

DEPARTMENT OF THE INTERIOR

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of review.

SUMMARY: The Service is issuing current lists of those plant taxa native to the U.S. being considered for listing as Endangered or Threatened under the Endangered Species Act of 1973, as amended (the Act). Such taxa should be considered in environmental planning. The present notice refines and updates three previous notices. A list is also provided of plant taxa which were previously under consideration for listing; but are presently presumed either extinct, not valid species, subspecies or varieties, or more abundant or widespread than previously believed and/or not subject to identifiable threats.

ADDRESSES: Interested persons or organizations are requested to submit comments to: Director (OES), U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240. Comments and materials relating to this notice are available for public inspection by appointment during normal business hours at the Service's Office of Endangered Species, Suite 500, 1000 North Glebe Road, Arlington, Virginia.

Information relating to particular plant taxa may be obtained from appropriate Service Regional Offices listed below:

Region 1—California, Hawaii, Idaho, Nevada, Oregon, Washington, and Pacific Trust Territories
Regional Director (ARD/FA), U.S. Fish and Wildlife Service, Suite 1692, Lloyd 500 Building, 500 NE. Multnomah Street, Portland, Oregon 97232, Telephone: 503/231-6131 (FTS: 8/429-6131)

Region 2—Arizona, New Mexico, Oklahoma, and Texas
Regional Director (ARD/FA), U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, Telephone: 505/766-3972 (FTS: 8/474-3972)

Region 3—Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin
Regional Director (ARD/FA), U.S. Fish and Wildlife Service, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111, Telephone: 612/725-3596 (FTS: 8/725-3596)

Region 4—Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the Virgin Islands
Regional Director (ARD/FA), U.S. Fish and Wildlife Service, The Richard B. Russell Federal Building, 75 Spring Street, SW., Atlanta, Georgia 30303, Telephone 404/221-3583 (FTS: 8/242-3583)

Region 5—Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia
Regional Director (ARD/FA), U.S. Fish and Wildlife Service, Suite 700, One Gateway Center, Newton Corner, Massachusetts 02158, Telephone: 617/965-5100 ext. 316 (FTS: 8/829-9316, 7, 8)

Region 6—Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming (Iowa and Missouri under Region 3 after October 1, 1980)
Regional Director (ARD/FA), U.S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal Center, Denver, Colorado 80225, Telephone: 303/234-2496 (FTS: 8/234-2496)

Alaska Area—Area Director, U.S. Fish and Wildlife Service, 1101 E. Tudor Road, Anchorage, Alaska 99503, Telephone: 907/276-3800, (FTS: Seattle Operator: 8/399-0150; 907/276-3800)

FOR FURTHER INFORMATION CONTACT: John L. Spinks, Jr., Chief, Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240 (703/235-2771), or the appropriate Regional Office.

SUPPLEMENTARY INFORMATION:

Background

Recognizing a special need to focus on the conservation of Endangered and Threatened plants, which were first accorded the means for Federal protection therein, the Endangered Species Act of 1973 directed the Secretary of the Smithsonian Institution to prepare a report on Endangered and Threatened plant species and recommend necessary conservation measures. The Smithsonian report, published as House Document No. 94-51, included a list of more than 3,000 native taxa thought to be extinct, Threatened, or Endangered. The Service published a notice on July 1, 1975 (40 FR 27823) in which it announced that the Smithsonian report had been accepted as a petition under the terms of the Act, and that the taxa named in the report were being reviewed for possible inclusion in the list of Endangered and Threatened species. One previous notice of review, which named four plants, had been published in April 1975 (40 FR 17612) in response to a petition. Many of these taxa were subsequently proposed for addition to the list on June 16, 1976 (41 FR 24523). Later, in 1977 (42 FR 40823) a third notice involving one plant was published. Because of the provisions of a 2-year limit for proposed rules in the Endangered Species Act Amendments of 1978 (Pub. L. 95-632), the 1976 proposal was mandatorily withdrawn in November 1979. Official notice of this withdrawal appeared on December 10, 1979 (44 FR 70796). That notice indicated that withdrawal was required because of the expiration of the deadline for making such rules final and was not related to the conservation status of the taxa proposed therein. The present notice is intended to reflect the Service's current judgment of the probable status of all plant taxa that were included either in previous notices or the 1976 proposal, as well as other taxa concerning which information has become available more recently. Taxa are grouped in several categories, as described below, in order to accurately reflect the Service's present evaluation of their status.

Category 1

Taxa for which the Service presently has sufficient information on hand to support the biological appropriateness of their being listed as Endangered or Threatened species. Because of the large number of such species, and because of the necessity of gathering data concerning the environmental and economic impacts of listings and designations of Critical Habitats, it is anticipated that the development and publication of proposed and final rules concerning such species will require several years. In some cases, although adequate data are now available to the Service to support re-proposal of species originally included in the withdrawn 1976 proposal, such species cannot be proposed for listing pending the receipt of sufficient new information warranting such action, as required by Section 4(f)(5) of the Act. The requirement that such re-proposals be based on new information has been interpreted to mean that such information must have been developed subsequent to the withdrawal of the original proposal on November 10, 1979. The Service requests that new information on the species named in this notice be submitted as soon as possible and on a continuing basis.

Also included in this list are taxa whose status in the recent past is known, but which may have already become extinct. These retain a high priority for addition to the list, subject to confirmation of extant populations. Such possibly extinct species are indicated by an asterisk (*). Double asterisks (**) indicate taxa thought to be extinct in the wild, but known to be extant in cultivation.

Category 2

Taxa for which information now in the possession of the Service indicates the probable appropriateness of listing as Endangered or threatened, but for which sufficient information is not presently available to biologically support a proposed rule. Further biological research and field study will usually be necessary to determine the status of the taxa included in this category. It is hoped that this notice will encourage such research. Some taxa included in this category are of doubtful taxonomic validity and require further taxonomic research before their status can be clarified. The fact that many of these taxa have previously been proposed and withdrawn for procedural reasons largely reflects changes in informational standards applied to listing procedures in recent years. Additional information concerning these taxa, especially that resulting from recent investigations, is particularly sought by the Service.

Category 3

Taxa no longer being considered for listing as Endangered or Threatened. Such taxa are included in one of three sub-categories, depending on the reasons for removal from consideration.

3A. Taxa for which the Service has persuasive evidence of extinction. If re-discovered, however, such species might acquire high priority for listing. At this time, the best available information indicates that the taxa included in this category, or the habitats from which they were known, are in fact extinct or destroyed, respectively.

3B. Names that on the basis of current taxonomic understanding, usually as represented in published revisions and monographs, do not represent taxa meeting the Act's definition of "species." Such supposed taxa could be re-evaluated in the future on the basis of subsequent research.

3C. Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat. Should further research or changes in land use indicate significant decline in any of these taxa, they may be re-evaluated for possible inclusion in categories 1 or 2.

The plants listed in categories 1 and 2 may be considered candidates for addition to the list of Endangered and Threatened plants and, as such, consideration should be given them in environmental planning.

The Service hereby solicits information concerning the status of any of the species included in the present lists. Information is particularly sought:

1. indicating that a taxon would more properly be assigned to a category other than the one in which it appears;
2. providing new information regarding a plant previously proposed for listing and withdrawn because of the expiration of two years before a final listing action;
3. recommending an area as Critical Habitat for a candidate taxon or indicating why it would not be prudent to propose Critical Habitat for the taxon;
4. nominating for listing consideration a taxon not contained in the present lists;
5. documenting threats to any of the taxa listed;
6. indicating taxonomic revisions of any taxa included;
7. suggesting new or more appropriate common names for taxa;
8. noting errors in indicated distribution, etc.

The Service intends to consider all information received in response to this notice and to amend the contents of categories 1, 2, and 3 to reflect the current state of knowledge concerning affected plant taxa, and to indicate its intentions with regard to future listing actions. Such changes will be indicated by periodic notices in the **Federal Register**.

The following lists are arranged alphabetically by names of genera and species. Synonyms have been provided when necessary to avoid confusion. In some cases, taxa have been included which have not yet been formally described in the scientific literature. Such taxa are usually identified by a name followed by "sp. (ssp., var.) nov. ined." Known historical ranges are given by state for all included taxa.

Table 1 contains the name of all taxa presently on the list of Endangered plants. The left-hand column indicates status (E—Endangered, T—Threatened).

Table 2 contains the names of all taxa that have been proposed for listing under the Act, but for which final action has not yet been taken.

Table 3 lists all taxa in categories 1 and 2 (candidates), as explained above. The left-hand column indicates category.

Table 4 lists all taxa in category 3, with the left-hand column indicating sub-categories.

A list of genera (Table 5) is also provided, arranged by families, for cross referencing.

This notice was principally prepared by the Botany staff of the Service's Endangered Species Program in the Washington Office of Endangered species and the Service's Regional and Area Offices. The Service gratefully acknowledges the assistance of Dr. John Nagy of Brookhaven National Laboratory, Upton, New York, for extensive technical assistance in compiling the lists of taxa.

Dated: September 25, 1980.

Ronald E. Lamberton,

Acting Director, Fish and Wildlife Service.

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TABLE A-1

TAXA CURRENTLY LISTED*

Taxon	T or E	Historic Distribution
Arctomecon humilis	E	UT
Astragalus perianus	T	UT
Astragalus yoder-williamsii	E	NV
Echinocereus englemannii var. _purpureus_	E	UT
Echinocereus triglochidiatus var. _inermis_	E	UT
Pediocactus sileri	E	UT
Phacelia argillacea	E	UT
Sclerocactus glaucus	T	UT
Sclerocactus wrightiae	E	UT

* As expected in Utah and Nevada.

TABLE A-2

TAXA CURRENTLY PROPOSED AS EXPECTED IN UTAH AND NEVADA

-NONE-

TABLE A-3

TAXA CURRENTLY UNDER REVIEW*

Taxon	Category	Historic Distribution
Agave utahensis var. eborispina	2	NV
Agave utahensis var. nevadensis	2	NV
Allium passeyi	1	UT
Angelica scabrida	1	NV
Antennaria arcuata	2	NV
Aquilegia barnebyi	2	UT
Arabis sp./sp. Nov. Ined.	2	UT
Arabis sp./sp. Nov. Ined.	2	UT
Arctomecon californica	1	NV
Arctomecon merriamii	2	NV
Arenaria kingii var. rosea	1	NV
Arenaria stenomeres	1	NV
Asclepias cutleri	1	UT
Asclepias Eastwoodiana	2	NV
Asclepias ruthiae	1	UT
Asclepias welshii	1	UT
Asplenium andrewsii	2	UT
Astragalus ackermannii	2	NV
Astragalus aequalis	1	NV
Astragalus ampullarius	2	UT
Astragalus barnebyi	1	UT
Astragalus beatleyae	1	NV
Astragalus callithrix	2	NV, UT
Astragalus calycosus var. monophyllidius	1	NV
Astragalus chloodes	1	UT
Astragalus cimae var. cimae	2	NV
Astragalus consobrinus	2	UT
Astragalus convallarius var. finitimus	2	UT
Astragalus cottamii	1	UT
Astragalus cronquistii	1	UT
Astragalus desereticus	1	UT
Astragalus funereus	1	NV
Astragalus geyeri var. triquetrus	1	NV
Astragalus hamiltonii	1	UT
Astragalus harrisonii	1	UT
Astragalus henrimontanensis	2	UT
Astragalus iselyi	1	UT
Astragalus lentiginosus var. latus	2	NV

* As expected in Utah and Nevada.

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Astragalus lentiginosus var. micans	1	NV
Astragalus lentiginosus var. sesquimetralis	1	NV
Astragalus lentiginosus var. ursinus	1	UT
Astragalus limnocharis	1	UT
Astragalus malacoides	2	UT
Astragalus mohavensis var. hemigyrus	1	NV
Astragalus montii	1	UT
Astragalus monumentalis	1	UT
Astragalus musimonum	2	NV
Astragalus oophorus var. clokeyanus	1	NV
Astragalus oophorus var. lonchocalyx	2	UT
Astragalus phoenix	1	NV
Astragalus porrectus	1	NV
Astragalus pseudiodanthus	2	NV
Astragalus pterocarpus	2	NV
Astragalus rafaelensis	1	UT
Astragalus robbinsii var. occidentalis	1	NV
Astragalus sabulosus	2	UT
Astragalus saurinus	2	UT
Astragalus serenoi var. sordescens	1	NV
Astragalus solitarius	2	NV
Astragalus sp.	2	UT
Astragalus sp./sp. Nov. Ined.	2	UT
Astragalus striatiflorus	1	UT
Astragalus tephrodes var. eurylobus	2	NV
Astragalus toquimanus	1	NV
Astragalus uncialis	1	NV
Astragalus wetherillii	2	UT
Astragalus welshii	2	UT
Brickellia knappiana	2	NV
Camissonia megalantha	2	NV, UT
Camissionia nevadensis	2	NV
Carex curatorum	2	UT
Castilleja aquariensis	1	UT
Castilleja parvula	1	UT
Castilleja revealii	1	UT
Castilleja salsuginosa	1	NV
Centaurium namophilum var. namophilum/Ined.	1	NV

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Cordylanthus tecopensis	2	NV
Coryphantha missouriensis var. marstonii	2	UT
Coryphantha vivipara var. rosea	2	NV, UT
Cryptantha barnebyi	1	UT
Cryptantha compacta	1	UT
Cryptantha elata	2	UT
Cryptantha hoffmannii	1	NV
Cryptantha insolita	1	NV
Cryptantha johnstonii	1	UT
Cryptantha jonesiana	1	UT
Cryptantha mensana	2	UT
Cryptantha ochroleuca	1	UT
Cryptantha semiglabra	2	UT
Cryptantha tumulosa	1	NV
Cuscuta warneri	1	UT
Cycladenia humilis var. jonesii	1	UT
Cymopterus basalticus	2	NV, UT
Cymopterus coulteri	1	UT
Cymopterus goodrichii	1	NV
Cymopterus higginsii	1	UT
Cymopterus minimus	1	UT
Cymopterus nivalis	2	NV
Cymopterus ripleyi var. saniculoides	2	NV
Dalea epica	2	UT
Draba arida	2	NV
Draba asprella var. zionensis	2	UT
Draba asterophora var. asterophora	2	NV
Draba crassifolia var. nevadensis	1	NV
Draba douglasii var. crockeri	2	NV
Draba jaegeri	1	NV
Draba maguirei var. burkei	2	UT
Draba maguirei var. maguirei	2	UT
Draba paucifructa	1	NV
Draba quadricostata	2	NV
Draba sobolifera	1	UT
Draba stenoloba var. ramosa	2	NV
Elodea nevadensis	1	NV
Enceliopsis nudicaulis var. corrugata	1	NV
Epilobium nevadense	1	NV, UT

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Erigeron cronquistii	1	UT
Erigeron kachinensis	2	UT
Erigeron latus	1	NV
Erigeron maguirei	1	UT
Erigeron mancus	1	UT
Erigeron ovinus	2	NV
Erigeron proselyticus	1	UT
Erigeron sionis	1	UT
Erigeron uncialis var. conjugans	2	NV
Eriogonum ammophilum	1	NV, UT
Eriogonum aretioides	1	UT
Eriogonum argophyllum	1	NV
Eriogonum bifurcatum	2	NV
Eriogonum clavellatum	2	UT
Eriogonum ocrymbosum var. davidsei	2	UT
Eriogonum corymbosum var. matthewsae	1	UT
Eriogonum cronquistii	2	UT
Eriogonum eremicum	2	UT
Eriogonum heermannii var. subracemosum	2	UT
Eriogonum holmgrenii	1	NV
Eriogonum humivagans	1	UT
Eriogonum jamesii var. rupicola	1	UT
Eriogonum lancifolium	2	UT
Eriogonum lemmonii	1	NV
Eriogonum lobbii var. robustum	1	NV
Eriogonum loganum	1	UT
Eriogonum microthecum var. johnstonii	1	CA*
Eriogonum microthecum var. panamintense	2	CA*
Eriogonum natum	1	UT
Eriogonum nummulare	2	UT
Eriogonum ostlundii	2	UT
Eriogonum ovalifolium var. Nov. Ined.	1	NV
Eriogonum panguicense var. alpestre	1	UT
Eriogonum smithii	1	UT
Eriogonum tumulosum	2	UT
Eriogonum viscidulum	1	NV
Ferocactus acanthodes var. acanthodes	2	NV
Festuca dasyclada	2	UT

* Species also found in study area; varriety may or may not be the same.

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Forsellesia pungens var. glabra	2	NV
Frasera gypsicola	1	NV
Frasera pahutensis	1	NV
Fraxinum cuspidata var. macropetala	2	NV
Gaillardia flava	1	UT
Galium hilendiae ssp. kingstonense	1	NV
Gilia caespitosa	1	UT
Gilia nyensis	2	NV
Glaucocarpum suffrutescens	1	UT
Grindelia fraxino-pratensis	1	NV
Gutierrezia sarothrae var.pomariensis	2	UT
Hackelia ophiobia	1	NV
Hackelia sp./sp. Nov. Ined.	1	UT
Haplopappus alpinus	2	NV
Hedysarum boreale var. gremiale	2	UT
Hedysarum occidentale var. canone	1	UT
Heterotheca jonesii	1	UT
Ivesia cryptocaulis	1	NV
Ivesia eremica	1	NV
Lathyrus hitchcockianus	1	NV
Lepidium barnebyanum	1	UT
Lepidium montanum var. neeseae	1	UT
Lepidium montanum var. stellae	1	UT
Lepidium nanum	2	NV
Lepidium ostleri	1	UT
Lesquerella garrettii	1	UT
Lesquerella hitchcockii	2	NV
Lesquerella rubicundula	2	UT
Lesquerella tumulosa	1	UT
Lewisia maguirei	1	NV
Lomatium latilobum	2	UT
Lomatium minimum	1	UT
Lupinus jonesii	2	UT
Lupinus malacophyllus	2	NV
Machaeranthera canescens var. ziegleri	2	CA*
Ma.haeranthera kingii	1	UT
Mentzelia argillosa	1	UT
Mentzelia leucophylla	1	NV
Mertensia toyabensis	2	NV
Musineon lineare	1	UT

* Species also found in study area; varriety may or may not be the same.

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Najas caespitosa	2	UT
Oenothera sp./sp. Nov. Ined.	2	UT
Opuntia basilaris var. woodburyi	2	UT
Opuntia whipplei var. multigeniculata	2	NV, UT
Oryctes nevadensis	2	NV
Oxytheca watsonii	1	NV
Parrya rydbergii	1	UT
Pediocactus despainii	1	UT
Pediocactus winkleri	1	UT
Penstemon angustifolius var. vernalensis	2	UT
Penstemon arenarius	1	NV
Penstemon atwoodii	1	UT
Penstemon bicolor ssp. bicolor	1	NV
Penstemon bicolor ssp. roseus	1	NV
Penstemon bracteatus	1	UT
Penstemon compactus	2	UT
Penstemon concinnus	1	UT
Penstemon francisci-pennellii	1	NV
Penstemon fruticiformis ssp. amargosae	1	NV
Penstemon garrettii	2	UT
Penstemon goodrichii	2	UT
Penstemon grahamii	2	UT
Penstemon humilis var. obtusifolius	2	UT
Penstemon keckii	2	NV
Penstemon moriahensis	2	NV
Penstemon nanus	2	UT
Penstemon pahutensis	1	NV
Penstemon parvus	1	UT
Penstemon patricus	2	UT
Penstemon procerus var. modestus	1	NV
Penstemon pudicus	1	NV
Penstemon rubicundus	2	UT
Penstemon sp./sp. Nov. Ined.	2	UT
Penstemon thompsoniae ssp. jaegeri	2	NV
Penstemon tidestromii	1	UT
Penstemon wardii	1	UT
Phacelia anelsonii	2	NV, UT
Phacelia beatleyae	1	NV

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Phacelia cephalotes	2	UT
Phacelia glaberrima	1	NV
Phacelia howelliana	1	UT
Phacelia inconspicua	1	NV
Phacelia indecora	1	UT
Phacelia mammillarensis	2	UT
Phacelia nevadensis	2	NV
Phacelia parishii	2	NV
Phacelia utahensis	1	UT
Phaseolus supinus	1	UT
Phlox gladiformis	2	NV, UT
Polygala subspinosa var. heterorhynca	2	NV
Polygonum utahense	2	UT
Primula capillaris	1	NV
Primula maguirei	1	UT
Primula nevadensis	1	NV
Psoralea epipsila	2	UT
Psoralea pariensis	1	UT
Psorothamnus polyadenius var. jonesii	2	UT
Ranunculus acriformis var. aestivalis	1	UT
Rorippa subumbellata	1	NV
Sclerocactus polyancistrus	1	NV, UT
Sclerocactus pubispinus	1	NV, UT
Sclerocactus sp./sp. Nov. Ined.	2	UT
Selaginella utahensis	2	NV, UT
Senecio dimorphophyllus var. intermedius	2	UT
Silene clokeyi	1	NV
Silene petersonii var. minor	1	UT
Silene petersonii var. petersonii	1	UT
Sphaeralcea caespitosa	1	NV, UT
Sphaeralcea psoraloides	2	UT
Sphaeromeria compacta	1	NV
Sphaeromeria ruthiae	1	UT
Streptanthus oliganthus	1	NV
Synthyris ranunculina	1	NV
Talinum validulum	2	UT
Thelypodiopsis argillacea	1	UT
Thelypodium sagittatum var. ovalifolium	2	NV, UT

TABLE A-3 (Cont.)

Taxon	Category	Historic Distribution
Townsendia alipgena var. *minima*	2	UT
Townsendia aprica	1	UT
Townsendia jonesii var. *tumulosa*	1	NV
Townsendia sp./sp. Nov. Ined.	2	NV
Trifolium andersonii ssp. *beatleyae*	2	NV
Trifolium andersonii var. *friscanum*	1	UT
Trifolium lemmonii	1	NV
Viguiera soliceps	2	UT
Viola purpurea var. *charlestonensis*	2	NV, UT
Xylorhiza confertifolia	1	UT
Zigadenus vaginatus	2	NV, UT

APPENDIX B

NEVADA LEGISLATION, NORTHERN NEVADA NATIVE PLANT SOCIETY LISTING AND BLM MEMORANDUM 80-722

APPENDIX B-1

NEVADA VEGETATION

PROTECTION AND PROPAGATION OF SELECTED SPECIES OF NATIVE FLORA

527.260 *Legislative finding.*

1. The legislature finds that:

(a) The economic growth of the State of Nevada has been attended with some serious and unfortunate consequences. Nevada has experienced the extermination or extirpation of some of her native species of flora. Serious losses have occurred and are occurring in other species of flora with important economic, educational, historical, political, recreational, scientific and aesthetic values.

(b) The people of the State of Nevada have an obligation to conserve and protect the various species of flora which are threatened with extinction.

2. The purpose of NRS 527.260 to 527.300, inclusive, is to provide a program for the conservation, protection, restoration and propagation of selected species of flora and for the perpetuation of the habitats of such species.

(Added to NRS by 1969, 775)

527.270 Species declared to be threatened with extinction; list of protected species; special permits for removal, destruction. A species or subspecies of native flora shall be regarded as threatened with extinction when the state forester firewarden, after consultation with competent authorities, determines that its existence is endangered and its survival requires assistance because of overexploitation, disease or other factors or because its habitat is threatened with destruction, drastic modification or severe curtailment. Any species declared to be threatened with extinction shall be placed on the list of fully protected species, and no member of its kind may be removed or destroyed at any time by any means except under special permit issued by the state forester firewarden.

(Added to NRS by 1969, 775)

527.280 Destruction, removal by state forester firewarden of dangerous species. Where any species of flora which is declared to be in danger of extinction pursuant to NRS 527.270 is found to be dangerous to domestic animals or fowl or a menace to health, the state forester firewarden may provide for its destruction or its removal, alive, for translocating.

(Added to NRS by 1969, 775)

527.290 Duties of governor. The governor shall review the programs which he administers and, to the extent practicable, utilize such programs in furtherance of the purpose of NRS 527.260 to 527.300, inclusive, and shall encourage other state and federal agencies to use their authorities in such a manner.

(Added to NRS by 1969, 775)

527.300 Powers, duties of state forester firewarden. In carrying out the program authorized by NRS 527.260 to 527.300, inclusive, the state forester firewarden, subject to the approval of the director of the state department of conservation and natural resources, shall cooperate, to the maximum extent practicable, with other states and with the counties in the State of Nevada, and may enter into agreements with such other states and counties and with other legal entities for the administration and management of any area established pursuant to NRS 527.260 to 527.300, inclusive, for the conservation, protection, restoration and propagation of species of native flora which are threatened with extinction.

(Added to NRS by 1969, 775; A 1977, 1168)

PROTECTION AND PROPAGATION OF SELECTED SPECIES OF FLORA

Critically Endangered Species List

Pursuant to the authority granted in NRS 527.270, the state forester firewarden hereby declares the following plants to be threatened with extinction and to be placed on the list of fully protected species:

1. Arctomecon californica Torr. & Frem.
2. Arenaria stenomeres Eastw.
3. Astragalus beatleyae Barneby
4. Astragalus geyeri Gray var. triquetris (Gray) Jones
5. Astragalus lentiginosus Doug. var. sesquimetralis (Rydb.) Barneby
6. Astragalus nyensis Barneby
7. Astragalus phoenix Barneby
8. Castilleja salsuginosa N. Holmgren
9. Cryptantha insolita (MacBr.) Payson
10. Eriogonum argophyllum Reveal
11. Eriogonum lemmonii S. Wats.
12. Eriogonum viscidulum J.T. Howell
13. Frasera gypsicola (Barneby) D.M. Post
14. Lathyrus hitchcockianus Barneby & Reveal
15. Mentzelia leucophylla Bdg.
16. Penstemon thurberi Torr. var. anestius Reveal & Beatley
+ 17. Phacelia inconspicua Greene
18. Primula capillaris N. Holmgren & A. Holmgren

Notes: Penstemon thurberi var. anestius is an invalid taxon and therefore will be deleted.

Species which will be added as a result of the Northern Nevada Native Plant Societies Plant Workshop (1980) are:
Astragalus yoder-williamsii
Astragalus mohavensis var. hemigyrus
Opuntia whipplei var. multigeniculata
Hackelia ophiobia
Eriogonum ovalifolium (currently the variety is in the process of being described. This species is known only from Steamboat Springs).

Lowell V. Smith
State Forester-Firewarden
Division of Forestry
Department of Conservation and Natural Resources
201 South Fall Street
Capitol Complex
Carson City, Nevada 89710

APPENDIX B-2

NNNPS LISTINGS

Northern Nevada Native Plant Society Listings

(February 1980)

List 1 -- ENDANGERED (** indicates plants directly affected by the MX, * indicates plants indirectly affected by the MX)

Astragalus beatleyae
* *A. lentiginosus* var. *sesquimetralis*
* *A. phoenix*
A. solitarius
** *A. tephrodes* var. *eurylobus*
** *A. uncialis*
** *Astragalus* unnamed species
* *Calochortus* unnamed species
** *Castilleja salsuginosa*
* *Centaurium namophilum*
* *Cryptantha insolita* (possibly extinct)
Elodea nevadensis
Eriogonum argophyllum
E. ovalifolium unnamed variety
** *Eriogonum viscidulum*
** *Frasera gypsicola*
Galium hilendiae ssp. *kingstonense*
Hackelia ophiobia
* *Ivesia eremica*
** *Lathyrus hitchcockianus*
* *Lewisia maguirei*
* *Mentzelia leucophylla*
** *Penstemon thurberi* var. *anestius*
Phacelia inconspicua
P. nevadensis
Primula capillaris
Rorippa subumbellata
* *Synthyris ranunculina*

List 2 -- THREATENED

* *Angelica scabrida*
Antennaria arcuata
* *A. soliceps*
* *Arctomecon californica*
* *Arenaria kingii* ssp. *rosea*
* *A. stenomeres*
Artemisia papposa
** *Asclepias eastwoodiana*
* *Astragalus aequalis*
** *A. callithrix*
** *A. calycosus* var. *monophillidius*
** *A. funereus*
** *A. geyeri* var. *triquetrus*
** *A. lentiginosus* var. *micans*
** *A. mohavensis* var. *hemigyrus*
* *A. oophorus* var. *clokeyanus*
** *A. porrectus*
** *A. pseudiodanthus*
* *A. robbinsii* var. *occidentalis*
** *A. serenoi* var. *sordescens*
** *A. toquimanus*
Brickellia knappiana
* *Calochortus striatus*
* *Cordylanthus tecopensis*
** *Coryphantha vivipara* var. *rosea*
** *Cryptantha hoffmannii*
* *Cryptantha tumulosa*
Cymopterus nivalis
Cymopterus unnamed species
Draba asterophora var. *asterophora*
D. crassifolia var. *nevadensis*
* *D. jaegeri*
* *D. paucifructa*
D. stenoloba var. *ramosa*
* *Enceliopsis nudicaulis* var, *corrugata*
* *Epilobium nevadense*
Erigeron latus
** *Eriogonum bifurcatum*
E. holmgrenii
E. lemmonii
E. lobbii var. *robustum*
** *Frasera pahutensis*
** *Fraxinus cuspidata* var. *macropetala*
* *Grindelia fraxino-pratensis*
* *Ivesia cryptocaulis*
* *Opuntia whipplei* var. *multigeniculata*
** *Oxytheca watsonii*
** *Penstemon arenarius*
* *P. bicolor* ssp. *bicolor*
* *P. bicolor* ssp. *roseus*
* *P. francisci-pennellii*
** *P. fruticiformis* ssp. *amargosae*
* *P. mariahensis*
P. pahutensis
P. procerus ssp. *modestus*
** *P. pudicus*
* *P. thompsoniae* ssp. *jaegeri*
** *Phacelia anelsonii*
P. beatleyae
** *P. glaberrima*
** *Phlox gladiformis*
Primula nevadensis
** *Sclerocactus polyancistrus*
** *S. pubispinus*
Selaginella utahensis
* *Silene clokeyi*
** *Sphaeralcea caespitosa*
* *Sphaeromeria compacta*
Streptanthus oliganthus
** *Thelypodium sagittatum* var. *ovalifolium*
* *Townsendia jonesii* var. *tumulosa*
Trifolium lemmonii
* *Viola purpurea* var. *charlestonensis*

List 3 -- WATCH LIST

** *Agave utahensis* var. *eborispina*
A. utahensis var. *nevadensis*
Arabis dispar
** *A. shockleyi*
** *Arctomecon merriamii*
Astragalus alvordensis
** *A. convallarius* var. *finitimus*
** *A. lentiginous* var. *latus*
A. musimonum
** *A. nyensis*
** *A. oophorus* var. *lonchocalyx*
** *A. pterocarpus*
Camissonia megalantha
C. nevadensis
* *Cirsium clokeyi*
** *Cryptantha interrupta*
** *Cymopterus basalticus*
** *C. corrugatus*
** *C. ripleyi* var. *saniculoides*
Draba arida
** *D. douglasii*
D. sphaeroides var. *cusickii*
** *Ephedra funerea*
Erigeron ovinus
* *Erigeron uncialis* var. *conjugans*
Eriogonum anemophilum
** *E. concinnum*
** *E. darrovii*
E. ovalifolium var. *caelestinum*
** *E. rubricaule*
** *Ferocactus acanthodes*
Forsellesia pungens
Geranium toquimense
** *Gilia nyensis*
** *G. ripleyi*
Haplopappus eximius
* *H. watsonii*
** *Hazardia (Haplopappus) brickellioides*
** *Hulsea vestita* ssp. *inyoensis*
** *Lepidium nanum*
* *Lesquerella hitchcockii*
** *Linanthus arenicola*
* *Lomatium ravenii*
** *Lupinus holmgrenanus*
L. malacophyllus
Lupinus montigenus
** *Machaeranthera grindelioides* var. *depr...*
** *M. leucanthemifolia*
Mertensia toyabensis
Mimulus washoensis
** *Mirabilis pudica*
** *Opuntia pulchella*
** *Oryctes nevadensis*
* *Penstemon keckii*
P. rubicundus
** *Perityle megalocephala* var. *intricata*
** *Peteria thompsoniae*
** *Phacelia mustelina*
** *P. parishii*
** *Polygala subspinosa* var. *heterorhynca*
** *Psorothamnus kingii*
** *Salvia funerea*
** *Silene scaposa* var. *lobata*
Smelowskia holmgrenii
** *Thelypodium laxiflorum*
** *Trifolium andersonii* ssp. *beatleyae*

List 4 -- DELETED from consideration in Nevada

Abronia orbiculata -- a synonym of widely distributed *A. turbinata*
Carex whitneyi -- not known from Nevada
Castilleja linoides -- a high elevation form of widely distributed *C. flava*
Croton wigginsii -- not known from Nevada
Cryptantha compacta -- not known from Nevada
Ditaxis diversiflora -- a synonym of widely distributed *Argythamnia cyanophylla*
Draba lemmonii var. *incrassata* -- not known from Nevada
Eriogonum eremicum -- not known from Nevada
Haplopappus aberrans -- not known from Nevada
Hazardia (Haplopappus) cana -- not known from Nevada
Isoetes bolanderi var. *pygmaea* -- not believed to occur in Nevada
Machaeranthera ammophila -- a synonym of widely distributed *Psilactis coulteri*
Nitrophila mohavensis -- not known from Nevada
Penstemon decurvus -- a synonym of widely distributed *P. humilis*
Penstemon nanus -- not known from Nevada
P. nyeensis -- a synonym of widely distributed *P. kingii*
Polemonium nevadensis -- a synonym of widely distributed *P. pulcherrimum*
Senecio lynceus var. *leucoreus* -- a synonym of widely distributed *S. multilobatus*

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APPENDIX B-3

BLM MEMORANDUM 722

E-TR-48-II-I

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August 20, 1980

Bureau of Land Management
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Instruction Memorandum No. 80- 72
Expires 9/30/81

To: All Field Officials

From: Director

Subject: Policy - Conservation of Sensitive, Threatened, or Endangered Plants, Endangered Species Act (ESA) of 1973, as Amended

A. BACKRGOUND

The ESA of 1973, as amended, requires that threatened or endangered (T/E) plant species be identified and conserved (see Enclosure 1 for definitions). Under Section 7 of the Act, the Bureau is required to actively manage species in danger of extinction, to ensure their conservation, and to consult with Fish and Wildlife Service (FWS) on any action that results in a may affect decision to ensure that any action authorized, funded, or carried out by the Bureau does not jeopardize the continued existence of a federally listed species and/or its Critical Habitat. The 1979 amendments to Section 7 now require us to confer with FWS on actions which might affect proposed species.

The Act provides civil and criminal penalties for violations of its provisions and permits citizens to sue to require compliance with the Act, making it one of the most stringent statutes affecting the Bureau of Land Management (BLM). The official Federal listing of a plant species (as T/E) creates a nondiscretionary, legally binding obligation on the part of BLM to use all its authorities to prevent the extinction of the plants as well as to avoid any action which would jeopardize the species' "existence."

BLM/State cooperation in matters concerning official State-listed species is mandated by Title II, Section 202(c)(3) of the Sikes Act (16 U.S.C. 670h), as amended, which states, in part, that cooperative agreements under this Act must ". . . provide adequate protection for fish and wildlife officially classified as threatened or endangered pursuant to Section 4 of the ESA of 1973 (16 U.S.C. 1533) or considered to be threatened, rare, or endangered by the State agency. . . ." Although plants are not specifically mentioned in the Sikes Act, the ESA of 1973 requires their consideration. Thus, plants should be included in Federal/State cooperative programs.

B. POLICY STATEMENT

It is Bureau policy to protect, conserve, and manage federally and State-listed or candidate listings of sensitive, threatened, or endangered plants and to use its authorities in furtherance of the purposes of the ESA and similar State laws. The Bureau, through its actions and/or

decisions in all planning and management activities, will ensure that actions authorized, funded, or carried out will not jeopardize the continued existence of such species or result in the destruction or modification of their Critical Habitats.

All candidate species for federally T/E status and sensitive species must be accorded the full protection of the ESA, unless it is determined by the State Director on a case-by-case basis that information on the occurrence of a plant species is adequate to allow a specific action.

The objectives of all programs will include the means to conserve officially listed plants, to promote delisting, and/or to enhance or maintain the ecosystems occupied by plants on Federal or official State inventories. It is also policy to ensure that the habitats of sensitive plants will be managed and/or conserved to minimize or eliminate the need for Federal or State listing in the future.

C. MANAGEMENT GUIDELINES

Management of federally or State-listed species must be implemented with the objective being the eventual delisting of such species. Sensitive species management should be carried out to secure these species' continued survival and ensure that future listing of such species is not necessary.

1. Federally T/E and Sensitive Species Lists

In order to implement BLM policy, it is imperative that each District develop and maintain an up-to-date list of all federally T/E, State-listed, and sensitive plant species which are known or suspected to occur on BLM-administered lands within that District or on adjacent lands which may reasonably be expected to be influenced by Bureau actions. Extreme care should be taken to include on each District list only plant species for which there is reasonable evidence for concern. Those species included in the Federal Register, July 1, 1975 (40 F.R. 27824-27924), and June 17, 1976 (41 F.R. 24524-24572), may serve as a basis for the District lists, but each species should be included only after close scrut[illegible] Indiscriminate inclusion of species on these lists will be counter-[illegible]ve. Suggestions should be solicited on an ongoing basis from all Bu[illegible]u field personnel, as well as appropriate persons in other agencies, universities, and local plant taxonomists, and where present from native plant societies and heritage programs. Through consolidation of the District lists, a current BLM State list should be developed and maintained and made available to all field offices.

The Office of Endangered Species of the FWS expects to have published in the Federal Register by early fall (1980) a listing of plant species under formal Notice of Review. Once available this list should be considered in revising the BLM State lists. All species in this Review which are candidates for T/E status should automatically be added to appropriate BLM State lists.

2. Inventory and Species Status Reports

It is the responsibility of the BLM under the ESA to conduct and maintain on a continuing basis an inventory of the occurrence, populations, and distributions of threatened and endangered plant species. The BLM State lists will afford field personnel with target species on which information can be gathered on an ongoing basis.

On a priority basis, each species should be studied to compile information on which intelligent management decisions for the species can be made. Coordination of such studies may be necessary at the State level in instances where a species is present in two or more Districts or States. The "Guidelines for the Preparation of Status Reports on Rare or Endangered Plant Species" (Enclosure 2) provides a concise format for the compilation of individual species status reports. These guidelines should be useful whether the information on a species is gathered by BLM personnel or by persons outside the Bureau on contract. The status reports for each species should never be considered a final product, but should be constantly upgraded and revised as new information becomes available.

3. Planning

As stated in Section 3(3) of the ESA, as amended, "The terms 'conserve', 'conserving', and 'conservation' mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." All land-use plans and activity plans should take into consideration the management of T/E and sensitive plant species to ensure their conservation. In some cases, it will be necessary for the conservation of species with restricted distributions to develop habitat management plans (HMPs). These HMPs should be done on a priority basis and should follow the format presented in BLM Manual Section 6620. Existing HMPs should be modified to include such species if they occur within the wildlife habitat area. In circumstances where threatened, endangered, and/or sensitive species occur in a narrowly defined area, this area should be examined to see if it meets the criteria for designation as an area of critical environmental concern (ACEC). The most recent BLM policy on ACECs is available in Organic Act Directive No. 77-77, Change 2. For species with disjunct occurrences or species which are widely dispersed HMPs may not be appropriate. In such cases, appropriate management plans should be developed following a format similar to that of HMPs.

George D. Lea

Deputy Director for Lands & Resources

2 Enclosures:
- Encl. 1 - Definitions
- Encl. 2 - Guidelines for the Preparation of Status Reports on Rare or Endangered Plant Species

Definitions

-C-

candidate species: See sensitive species

conservation: The use of all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the ESA or similar State laws are no longer necessary.

Critical Habitat: Any air, land, or water area (exclusive of those existing manmade structures or settlements which are not necessary to the survival and recovery of a listed species) and constituent elements thereof, the loss of which would appreciably decrease the likelihood of the survival and recovery of a listed species or a distinct segment of its population. The constituent elements of Critical Habitat include, but are not limited to: physical structures and topography, biota, climate, human activity, and the quality and chemical content of land, water, and air. Critical Habitat may represent any portion of the present habitat of a listed species and may include additional areas for reasonable population expansion.

-E-

endangered species: Any species of plant or animal which is in danger of extinction throughout all or a significant portion of its range.

-F-

federally listed species: Those species of plants classified by the Secretary of the Interior or the Secretary of Commerce as threatened or endangered pursuant to Section 4 of the ESA.

-J-

jeopardize the continued existence of: Any action which would result in the reduction of the numbers of a sensitive or officially listed species to such an extent that the loss would pose a threat to its continued survival or recovery in the wild.

-O-

officially listed species: Includes both federally and State-listed species of plants.

-P-

plant: Any member of the plant kingdom, including seeds, roots, and other parts thereof.

-S-

sensitive species: (candidate) Species not yet officially listed but which are undergoing a status review or are proposed for listing according to Federal Register notices published by the Secretary of the Interior or the Secretary of Commerce, or according to comparable State documents published by State officials.

Species whose populations are consistently small and widely dispersed, or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat availability, or habitat condition might lead toward extinction.

Species whose numbers are declining so rapidly that official listing may become necessary as a conservation measure. Declines may be the result of one or more of several factors including: destruction, modification, or curtailment of the species or habitat; overuse for commercial, scientific, or educational purposes; disease; the inadequacy of existing regulatory mechanisms; and/or other natural or manmade factors adversely affecting the species' continued existence.

species: Plant taxa at the rank of species, subspecies, variety, or significant occurrences of any such taxa.

State-listed species: A species of plants or animals classified by a State government, pursuant to State laws and/or regulations, in categories implying potential extinction throughout all or a significant portion of its range, especially extirpation within the respective State.

-T-

threatened species: Any plant species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

E-TR-48-II-I

Bureau of Land Management
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DISTRICT OFFICE
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IN REPLY REFER TO:
General
6840 (240)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

SEP 15 1980

September 8, 1980

Instruction Memorandum No. 80-722, Change 1
Expires 9/30/81

To: All Field Officials

From: Director

Subject: Policy - Conservation of Sensitive, Threatened, or Endangered (T/E) Plants, Endangered Species Act (ESA) of 1973, as Amended

To clarify the process of developing sensitive species lists, the following underlined sentences and word changes are being added to C1 of Instruction Memorandum No. 80-722.

C. MANAGEMENT GUIDELINES

Management of federally or State-listed species must be implemented with the objective being the eventual delisting of such species. Sensitive species management should be carried out to secure these species' continued survival and ensure that future listing of such species is not necessary.

1. Federally T/E, State-Listed T/E, and Sensitive Species Lists

In order to implement the Bureau of Land Management (BLM) policy, it is imperative that each District develop and maintain an up-to-date list of all federally T/E, State-listed, and sensitive plant species ~~which are~~ known or suspected to occur on BLM-administered lands within that District or on adjacent lands which may reasonably be expected to be influenced by Bureau actions. Three lists should be developed. One will include all federally listed T/E species; the second, all State-listed T/E species; and the third, all sensitive species (see definition on Enclosure 1-2). Extreme care should be taken to include on each District sensitive species list only plant species for which there is reasonable evidence for concern. Those species included in the Federal Register, July 1, 1975 (40 F.R. 27824-27924), and June 17, 1976 (41 F.R. 24524-24572), may serve as a basis for the District lists, but each species should be included only after close scrutiny. Indiscriminate inclusion of species on these lists will be counter-productive. Suggestions should be solicited on an ongoing basis from all Bureau field personnel, as well as appropriate persons in other agencies, universities, and local plant taxonomists, and where present from native plant societies and heritage programs. Through consolidation of the District lists, a current BLM State list should be developed and maintained. Those species which are rare or infrequent in one District but are common or secure elsewhere in the State should not generally be included on the State sensitive species list. The State sensitive species list will serve as the official sensitive plant species document, and a copy of this list should be sent to all Field Offices.

The Office of Endangered Species of the Fish and Wildlife Service expects to have published in the Federal Register by early fall (1980) a listing of plant species under formal Notice of Review. Once available this list should be considered in revising the BLM State lists. All species in this Review which are candidates for T/E status should automatically be added to appropriate BLM State sensitive species lists.

Substitute the following definition under "sensitive species" on Enclosure 1-2 of Instruction Memorandum No. 80-722:

-S-

sensitive species: A species included on a sensitive species list developed by the State Office pursuant to section C1 of this Instruction Memorandum and approved by the State Director. These lists will generally include any species in the State which meet any of the following criteria:

a. Candidate species, i.e., any species not yet officially listed but which are undergoing a status review or are proposed for listing according to Federal Register notices published by the Secretary of the Interior or the Secretary of Commerce.

b. Rare or infrequent species whose populations are consistently small and widely dispersed, or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat, or habitat condition might lead toward extinction.

c. Other species whose numbers are declining so rapidly that official listing may become necessary as a conservation measure. Declines may be the result of one or more of several factors including: overuse for commercial, scientific, or educational purposes; disease, predation, or grazing; the inadequacy of existing regulatory mechanisms; and/or other natural or human factors adversely affecting the species continued existence.

George A. Lea

Deputy Director for Lands and Resources

APPENDIX C

BIRDS, REPTILES, MAMMALS, AND AMPHIBIANS
EXPECTED IN DRY LAKE VALLEY

APPENDIX C

TABLE C-1

TYPICAL WILDLIFE EXPECTED IN DRY LAKE VALLEY: BIRDS

Species	Big Sage Habitat	Shadscale and Greasewood Habitat	Pinyon-Juniper Habitat
Vultures (Cathartidae)			
Turkey Vulture (Cathartes aura)	S	S	S
Hawks (Accipitridae)			
Cooper's Hawk (Accipiter cooperii)	M,S	M,S	M,S
Red-tailed Hawk (Buteo jamaicensis)	R		
Rough-legged Hawk (Buteo lagopus)		W	
Ferruginous Hawk (Buteo regalis)		M,S	
Golden Eagle (Aquila chrysaetos)	R	R	
Northern Harrier (Circus cyaneus)	R	R	
Falcons (Falconidae)			
Prairie Falcon (Falco mexicanus)	R	R	
American Kestrel (Falco sparvarius)	R	R	
Quail (Phasianidae)	R	R	
Gambel's quail (Lophortyx gambelii)	R	R	
Doves (Columbidae)			
Mourning Dove (Zenaida macroura)	M,S	M,S	M,S
Owls (Strigidae)			
Great Horned Owl (Bubo virginianus)			R
Burrowing Owl (Athene cunicularia)		R	
Nightjars (Caprimulgidae)			
Poorwill (Phalaenoptilus nuttalli)		S	
Common Nighthawk (Chordeiles minor)	M,S		

R = Resident; M = Migrant; S = Summer resident;
W = Winter resident.

Source: Ryser, 1976.

TABLE C-1 (Cont.)

Species	Big Sage Habitat	Shadscale and Greasewood Habitat	Pinyon-Juniper Habitat
Woodpeckers (Picidae)			
Common Flicker (Colaptes auratus)	R		R
Flycatchers (Tyrannidae)			
Western Kingbird (Tyrannus verticalis)		M,S	M,S
Gray Flycatcher (Empidonax oberholseri)	M,S		M,S
Larks (Alaudidae)			
Horned Lark (Eremophila alpestris)		R	
Swallows (Hirundinidae)			
Violet-green Swallow (Tachycineta thalassina)	M,S	M,S	
Barn Swallow (Hirundo rustica)	M,S	M,S	
Crows (Corvidae)			
Common Raven (Corvus corax)	R	R	
Common Crow (Coruus brachyrhnchos)	R	R	
Scrub Jay (Aphelocoma coerulescens)			R
Pinyon Jay (Gymnorhinus cyanocephalus)	R		R
Black-billed Magpie (Pica pica)	R		R
Bushtits (Paridae)			
Plain titmouse (Parus inornatus)			R
Wrens (Troglodytidae)			
Rock Wren (Salpinctes obsoletus)		R	
Cactus Wren (Campylorhynchus brunneicapillum)		R	
Thrashers (Mimidae)			
Sage Thrasher (Oreoscoptes montanus)	M,S		

TABLE C-1 (Cont.)

Species	Big Sage Habitat	Shadscale and Greasewood Habitat	Pinyon-Juniper Habitat
Kinglets (Muscicapidae)			
Blue-Gray Gnatcatcher (Polioptila caerulea)	S		S
Ruby-crowned Kinglet (Regulus calendula)			M,S
Shrikes (Laniidae)			
Loggerhead Shrike (Lanius ludovicianus)	R	R	
Northern Shrike (Lanius excubitor)	W	W	
Blackbirds (Icteridae)			
Northern Oriole (Icterus galbula)	S		
Brewer's Blackbird (Euphagus cyanocephalus)	R		
Brown-headed Cowbird (Molothrus ater)	M,S	M,S	
Western Meadowlark (Sturnella neglecta)	M,R	M,R	
Sparrows and Finches (Fringillidae)			
Black-headed Grosbeak (Pheucticus melanocephalus)			M,S
House Finch (Carpodacus mexicanus)	R		R
American Goldfinch (Spinus tristis)	M,S		
Green-tailed Towhee (Chlorura chlorura)	ST		
Vesper Sparrow (Pooecetes gramineus)	M,S	M,S	
Lark Sparrow (Chondestes grammacus)	M,S	M,S	
Black-throated Sparrow (Amphispiza hilineata)	S	S	
Sage Sparrow (Amphispiza belli)	S	S	
Dark-eyed Junco (Junco hyemalis)	M,W		
Brewer's Sparrow (Spizella breweri)	M,S		
White-crowned Sparrow (Zonotrichia leucophrys)	M	M	

TABLE C-2

TYPICAL WILDLIFE EXPECTED IN DRY LAKE VALLEY: AMPHIBIANS, REPTILES, AND MAMMALS

Species	Big Sage Habitat	Shadscale and Greasewood Habitat	Pinyon-Juniper Habitat
AMPHIBIANS			
Frogs and Toads			
Great Basin Spadefoot (*Scaphiopus intermontanus*)	X		
REPTILES			
Lizards			
Zebra-tailed Lizard (*Callisaurus draconoides*)		X	
Long Nosed Leopard Lizard (*Gambelia wislizenii*)	X	X	
Collared Lizard (*Crotaphytus collaris*)		X	
Side-blotched Lizard (*Uta stansburiana*)	X	X	X
Desert Horned Lizard (*Phrynosoma platyrhinos*)		X	
Great Basin Whiptail (*Cnemidophorus tigris tigris*)	X	X	X
Great Basin Fence Lizard (*Sceloporus occidentalis biseriatus*)	X		
Desert Spiny Lizard (*S. magistar*)		X	
Sagebrush Lizard (*S. graciosus*)	X	X	
Western Skink (*Eumeces skiltonianus*)	X		X
Snakes			
Coachwhip (*Masticophis flagellum*)		X	
Striped Whipsnake (*M. taeniatus*)	X	X	
Western patch-nosed Snake (*Salvadora hexalepis*)		X	
Great Basin Gopher Snake (*Pituophis melanoleucus deserticola*)	X	X	X
Long-nosed Snake (*Rhinocheilus lecontei*)		X	
Western Groundsnake (*Sonora semiannulata*)	X		

TABLE C-2 (Cont.)

Species	Big Sage Habitat	Shadscale and Greasewood Habitat	Pinyon-Juniper Habitat
Snakes (Cont.)			
Spotted Nightsnake (*Hypsiglena torquata*)	X		
Great Basin Rattlesnake (*Crotalus viridis lutosus*)	X	X	X
MAMMALS			
Bats			
Merriam Shrew (*Sorex merriami*)	X		
Small-footed Myotis (*Myotis subulatus*)	X		X
California Myotis (*M. californicus*)		X	X
Little Brown Myotis (*M. lucifugus*)			X
Western Pipistrelle (*Pipistrellus hesperus*)		X	X
Big Brown Bat (*Eptesicus fuscus*)	X	X	X
Pallid Bat (*Antrozous pallidus*)	X	X	
Big-eared Bat (*Plecotus townsendi*)	X		X
Big Freetail Bat (*Tadarida macrotis*)			X
Rabbits			
Black-tailed Jackrabbit (*Lepus californicus*)	X	X	X
Desert Cottontail (*Sylvilagus auduboni*)	X	X	X
Rodents			
Rock Squirrel (*Spermophilus variegatus*)	X	X	X
Whitetail Antelope Ground Squirrel (*Ammospermophilus leucurus*)		X	X
Valley Pocket Gopher (*Thomomys bottae*)	X	X	X
Little Pocket Mouse (*Perognathus longimembris*)	X	X	X

TABLE C-2 (Cont.)

Species	Big Sage Habitat	Shadscale and Greasewood Habitat	Pinyon-Juniper Habitat
Rodents (Cont.)			
Great Basin Pocket Mouse (*P. parvus*)	X	X	X
Ord's Kangaroo Rat (*Dipodomys ordii*)	X	X	
Great Basin Kangaroo Rat (*D. microps*)	X	X	
Desert Kangaroo Rat (*D. deserti*)		X	
Merriam Kangaroo Rat (*D. merriami*)		X	
Western Harvest Mouse (*Reithrodontomys megalotis*)	X	X	
Deer Mouse (*Peromyscus maniculatus*)	X	X	X
Cactus Mouse (*P. eremicus*)			X
Pinyon Mouse (*P. truei*)			X
Canyon Mouse (*P. crinitus*)		X	
Southern Grasshopper Mouse (*Onychomys torridus*)	X	X	
Sagebrush Vole (*Lagurus curtatus*)	X		
Desert Woodrat (*Neotoma lepida*)		X	
Porcupine (*Erethizon dorsatus*)	X		X
Carnivores			
Badger (*Taxidea taxus*)	X	X	
Spotted Skunk (*Spilogale gracilis*)			X
Striped Skunk (*Mephitis mephitis*)	X	X	X
Coyote (*Canis latrans*)	X	X	X
Gray Fox (*Urocyon cinereoargentus*)	X		X
Kit Fox (*Vulpes macrotis*)	X	X	X
Bobcat (*Lynx rufus*)	X	X	X
Mountain Lion (*Felis concolor*)			X

Sources: U.S. Air Force 1980; Cox 1980.

APPENDIX D

BIOLOGICAL DATA FORMS

SAMPLE UNIT RECORD FORM

1. Sample Unit Number:_______________ 2. Photo Number(s)_______________

3. Map:_______________ 7. Location of Unit Within Section

4. Township_______________ N

5. Range_______________

6. Section_______________

8. Compass coordinate from the true point of beginning_______________

9. Elevation_______________

10. Date (MM/DD/YY)_______________

11. Crew Leader/Recorder (Name)_______________

12. Other Crew Members_______________

13. General Survey Conditions (Circle one only): Good Average Poor

14. Describe General Survey Conditions:

15. Describe Method and Accuracy of Locating Sampling Unit:

16. Drainage (rank at least one)

Converging Diverging Braided Other (describe)

17. Distance to Nearest Permanent Water ___________m

18. Type (Circle one only): Spring Seep Lake Stream Other

19. Slope (rank at least one)

___ Level (0-3 degrees)

___ Gentle (3-8 degrees)

___ Moderate (8-16 degrees)

___ Steep (16-26 degrees)

___ Very Steep/Prec. (>26 degrees)

20. Aspect (rank at least one)

___North ___South

___Northeast ___Southwest

___East ___West

___Southeast ___Northwest

___None

21. Disturbance (rank at least one)

___Off-Road Vehicles

___Mining

___Other Construction

___Erosion

___Grazing

___Other Animal Disturbances

___Cultivated Agriculture

___Other

22. Intensity of Disturbance (Circle one)

High Moderate Low

23. Describe Disturbance

24. Percent perennial vegetation cover:

	% Cover dm	Vegetation Association	Density
Line 1			
Line 2			

25 Parental Soil Material (circle one only)

Residual

Colluvial

Alluvial

Glacial

Eolian

26. Soil Texture (rank the composition of the particles composing the soil)

___Course gravel 7.500 mm

___Fine gravel 2.000 mm

___Course sand 2.000 mm

___Fine sand .074 mm

___Silt .074-.005 mm

___Clay .005-.001 mm

27. Describe General Observations:

28. Vegetation (Major Plant Associations)

29. Wildlife - (Species list and numbers seen, animal sign, etc.)

30. DESCRIBE - Sensitive habitats for flora or fauna:

31. DESCRIBE - Sensitive, threatened, or endangered flora species:

32. DESCRIBE - Sensitive, threatened, or endangered fauna species:

SAMPLE UNIT RECORD FORM

VEGETATION TYPE ______________ SAMPLE UNIT # ______________

TRANSECT ______________ CREW LEADER ______________

PG.___ OF___ DATE ______________

Species	Cover (dm)	Total dm	Cover (%)	Relative Cover (%)	Number of Individuals	Density (%)	Relative Density(%)
	TOTALS						

OTHER SPECIES ON SITE:

APPENDIX E

APPENDIX E

KEY TO FIGURES
3-24 through 3-33

Symbols, and Scientific and Common Names for
Plant Species in Dry Lake Valley, Nevada

Symbol	Scientific Name	Common Name
Arno	*Artemisia nova*	black sagebrush
Artr	*Artemisia tridentata*	big sagebrush
Atca	*Atriplex canescens*	fourwing saltbush
Atco	*Atriplex confertifolia*	shadscale
Cela	*Ceratoides lanata*	whitesage (winterfat)
Chgr	*Chrysothamnus greenei*	Greene's rabbitbrush
Chvi	*Chrysothamnus viscidiflorus*	green rabbitbrush
Come	*Cowania mexicana*	cliffrose
Epne	*Ephedra nevadensis*	Mormon tea
Grsp	*Grayia spinosa*	spiny hopsage
Gumi	*Gutierrezia microcephala*	threadleaf snakeweed
Gusa	*Gutierrezia sarothrae*	broom snakeweed
Gu	*Gutierrezia* sp.	snakeweed
Hija	*Hilaria jamesii*	galleta
Koam	*Kochia americana*	green molley
Lyan	*Lycium andersonii*	Anderson wolfberry
Orhy	*Oryzopsis hymenoides*	Indian ricegrass
Save	*Sarcobatus vermiculatus*	greasewood
Sihy	*Sitanion hysterix*	squirreltail grass
Spcr	*Sporobolus cryptandrus*	sand dropseed
Tegl	*Tetradymia glabrata*	littleleaf horsebrush
Yubr	*Yucca brevifolia*	Joshua tree

APPENDIX E

KEY TO FIGURES 3-24 THROUGH 3-33 AND TRANSECT RESULTS FOR DRY LAKE VALLEY

APPENDIX E

Species Key for Transect Data

The following tables contain data compiled from the transects made during the field survey. Shelter sites which were resited are placed at the end of the tables in a separate section, rather than being included with the original cluster data. These tables give total perennial cover, percent relative cover, density, and percent relative density for all perennial species that intercepted the transect line. Dominant and subdominant species are indicated by a (d) and (s) respectively, placed next to the species abbreviation.

Definitions of cover and density are as follows:

$$\text{total cover (\%)} = \frac{\text{total plant cover (dm)}}{\text{distance of transect (dm)}} \times 100$$

$$\text{relative cover (\%)} = \frac{\text{total cover of species A}}{\text{total plant cover (dm)}} \times 100$$

$$\text{density} = \frac{\text{number of plants of species A}}{\text{distance of transect (dm)}}$$

$$\text{relative density (\%)} = \frac{\text{number of plants of species A}}{\text{number of plants of all species}} \times 100$$

Species names are abbreviated, and indicated by the first two letters of the genus and species. The key to the abbreviations is as follows:

APPENDIX E

Species Key for Transect Data

AMER	Ambrosia eriocentra
AM	Ambrosia sp.
ARPU	Aristida purpurea
ARSP	Artemisia spinescens
ARTR	Artemisia tridentata
ATCA	Atriplex canescens
ATCO	Atriplex confertifolia
ATSP	Atriplex spinifera
BRTE	Bromus tectorum
CELA	Ceratoides lanata
CHGR	Chrysothamnus greenei
CHNA	Chrysothamnus nauseosus
CHVI	Chrysothamnus viscidiflorus
CH	Chrysothamnus sp.
COME	Cowania mexicana
EPNE	Ephedra nevadensis
ERCA	Eriogonum caespitosum
ERDE	Eriogonum deflexum
ERMI	Eriogonum microthecum
ERPU	Erioneuron puchellum
EU	Euphorbia sp.
FAPA	Fallugia paradoxa
GRSP	Grayia spinosa
GUMI	Gutierrezia microcephala
GUSA	Gutierrezia sarothrae
GU	Gutierrezia sp.
HAGL	Halogeton glomeratus
HIJA	Hilaria jamesii
KOAM	Kochia americana
LYAN	Lycium andersonii
MACA	Machaeranthera canescens
MA	Machaeranthera sp.
OPEC	Opuntia echinocarpa
OPER	Opuntia erinacea
OPPU	Opuntia pulchella
OP	Opuntia sp.
ORHY	Oryzopsis hymenoides
PEPA	Penstemon palmeri
PRFA	Prunus fasciculata
SAIB	Salsola iberica
SAVE	Sarcobatus vermiculatus
SIHY	Sitanion hysterix
SPAM	Sphaeralcea ambigua
SPGR	Sphaeralcea grossulariifolia
SPCR	Sporobolus cryptandrus
SP	Sporobolus sp.
SUFR	Suaeda fruticosa
SUTO	Suaeda torreyana
SY	Symphoricarpos sp.
TEAX	Tetradymia axillaris
TEGL	Tetradymia glabrata
TESP	Tetradymia spinosa
VIMU	Viguiera multiflora
YUBR	Yucca brevifolia

TABLE E-1
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 1

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CELA (s)	45.6	9.1	25.0	22	4.4	50.0	19.4	8.9	11.4	11	2.2	20.7
SS 1/1	CHGR (d)	65.4	13.1	36.0	16	3.2	36.0	97.7	19.5	57.3	25	5.0	47.2
	EPNE							13.9	2.8	8.2	2	0.4	3.8
	TEGL	15.0	3.0	8.5	2	0.4	5.0	6.2	1.2	3.6	2	0.4	3.8
	ATSP							1.5	0.3	0.9	1	0.2	1.9
	HIJA							1.5	0.3	0.9	2	0.4	3.8
	ORHY							6.0	1.2	3.5	2	0.4	3.8
	SPAM							2.0	0.4	1.2	1	0.2	1.9
	GRSP	55.0	11.0	30.0	3	0.6	7.0	1.0	0.2	0.5	1	0.2	1.9
	SIHY	1.0	0.2	0.5	1	0.2	2.0	21.3	4.3	12.5	6	1.2	11.2
		182.0	36.4	100.0	44	8.8	100.0	170.5	39.1	100.0	53	10.6	100.0
MX 181	ATSP							5.0	1.0	2.8	2	0.4	2.4
SS 1/2	CELA (d)	38.2	7.6	21.8	20	4.0	40.9	170.0	34.0	95.5	77	15.4	94.0
	CHGR (s)	136.1	27.2	77.6	28	5.6	57.1	2.0	0.4	1.1	1	0.2	1.2
	ORHY	1.0	0.2	0.6	1	0.2	2.0	1.1	0.2	0.6	2	0.4	2.4
		175.3	35.0	100.0	49	9.8	100.0	178.1	35.6	100.0	82	16.4	100.0
MX 181	ATSP							0.5	0.1	0.4	1	0.2	2.2
SS 1/3	CELA (s)	35.9	7.2	15.7	15	3.0	33.3	21.5	4.1	20.7	8	1.6	17.8
	CHGR (d)	176.4	35.3	77.1	27	5.4	60.0	79.5	15.3	76.5	31	6.2	68.9
	GRSP	16.4	3.3	7.2	3	0.6	6.7	0.5	0.1	0.4	1	0.2	2.2
	TEGL												
	ORHY							2.2	0.4	2.0	4	0.8	8.9
		228.7	45.8	100.0	45	9.0	100.0	104.2	20.8	100.0	45	9.0	100.0
MX 181	ATSP	4.0	0.8	4.0	3	0.6	4.5	7.0	1.4	5.3	2	0.4	3.1
SS 1/4	CELA (d)	60.1	12.0	60.5	34	6.8	51.5	103.5	20.7	78.2	46	9.2	72.0
	CHGR (s)	16.0	3.2	16.0	3	0.6	4.5	10.0	2.0	7.6	6	1.2	9.3
	HIJA	3.0	0.6	3.0	2	0.4	3.0						
	ORHY	2.5	0.5	2.5	3	0.6	4.5						
	SPAM	13.9	2.8	14.0	21	4.2	32.0	11.8	2.3	8.9	10	2.0	15.6
		99.5	19.9	100.0	66	13.2	100.0	222.3	26.4	100.0	64	12.8	100.0

(d) dominant species

(s) subdominant species

TABLE E-1 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181	ARSP	1.0	0.2	0.6	1	0.2	2.2	8.5	1.7	5.4	1	0.2	3.0
SS 1/5	CELA (s)	42.5	8.5	24.4	18	3.6	39.1						
	CHGR (d)	80.3	16.1	46.1	15	3.0	32.6	136.0	27.2	86.2	28	5.6	85.0
	GRSP	26.5	5.3	15.3	3	0.6	6.5	1.5	0.3	0.9	1	0.2	3.0
	TEGL	9.0	1.8	5.2	1	0.2	2.2						
	HIJA	5.5	1.1	3.2	4	0.8	8.7						
	ORHY	1.0	0.2	0.6	1	0.2	2.2	1.0	0.2	0.6	1	0.2	3.0
	SPAM	7.5	1.5	4.4	3	0.6	6.5	1.0	0.2	0.6	1	0.2	3.0
	GUMI							10.0	2.0	6.3	1	0.2	3.0
		173.3	34.7	99.8	46	9.2	100.0	158.0	31.6	100.0	33	6.6	100.0
MX 181	ARSP (s)	55.0	11.0	29.7	19	3.8	26.0	16.0	3.2	10.9	9	1.8	13.7
SS 1/6	CELA	27.0	5.4	14.6	12	2.4	16.4	19.0	3.8	13.0	14	2.8	21.3
	CHGR (d)	85.7	17.1	46.3	22	4.4	30.2	105.0	21.0	71.8	35	7.0	53.0
	GUMI							2.0	0.4	1.5	1	0.2	1.5
	ORHY	1.0	0.2	0.5	1	0.2	1.4	0.5	0.1	0.3	1	0.2	1.5
	SPAM	16.5	3.3	8.9	19	3.8	26.0	3.7	0.7	2.5	6	1.2	9.0
		185.2	37.0	100.0	73	14.6	100.0	146.2	29.2	100.0	66	13.2	100.0
MX 181	ATSP	7.0	1.4	5.3	3	0.6	3.7	29.2	5.8	20.4	13	2.6	17.6
SS 1/7	CELA (s)	59.3	11.9	45.2	31	6.2	36.4	12.5	2.5	8.7	9	1.8	12.2
	CHGR (d)	37.2	7.4	28.4	18	3.6	21.2	76.5	15.3	53.4	23	4.6	31.1
	ATCA							8.4	1.7	5.9	4	0.8	5.4
	GRSP	9.0	1.8	7.0	2	0.4	2.4						
	HIJA	6.5	1.3	5.0	16	3.2	18.7	3.5	0.7	2.4	10	2.0	13.5
	ORHY	1.5	0.3	1.1	1	0.2	1.2	1.7	0.3	1.2	2	0.4	2.6
	SPAM	10.6	2.1	8.0	14	2.8	16.4	11.4	2.3	8.0	13	2.6	17.6
		131.1	26.2	100.0	85	17.0	100.0	143.2	28.6	100.0	74	14.8	100.0
MX 181	ATSP	5.0	1.0	4.4	2	0.4	4.6	3.0	0.6	2.2	1	0.2	2.0
SS 1/8	CELA (s)	54.0	10.8	47.2	28	5.6	63.6	21.2	4.2	15.3	11	2.2	22.9
	CHGR (d)	36.5	7.3	31.8	11	2.2	25.0	100.5	20.1	72.5	33	6.6	68.8
	GRSP	19.0	3.8	16.6	3	0.6	6.8	14.0	2.8	10.0	3	0.6	6.3
		114.5	22.9	100.0	44	8.8	100.0	138.7	27.7	100.0	48	9.6	100.0

TABLE E-1 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ATSP	1.0	0.2	0.8	1	0.2	3.2	12.0	2.4	7.9	3	0.6	11.1
SS 1/9	CHVI (s)	50.5	10.1	39.7	12	2.4	38.8						
	CHGR	4.0	0.8	3.1	1	0.2	3.2	44.0	8.8	29.2	9	1.8	33.3
	EPNE	34.0	6.8	26.7	8	1.6	25.9	13.0	2.6	8.7	3	0.6	11.1
	GRSP (d)	27.0	5.4	21.3	4	0.8	12.9	29.5	5.9	19.5	5	1.0	18.6
	LYAN	3.0	0.6	2.4	1	0.2	3.2						
	TEGL	4.0	0.8	3.1	1	0.2	3.2	52.5	10.5	34.8	7	1.4	25.9
	HIJA	3.7	0.7	2.9	3	0.6	9.6						
		127.2	25.4	100.0	31	6.2	100.0	151.0	30.2	100.1	27	5.4	100.0
MX 181	CELA (s)	43.3	8.6	34.5	19	3.8	38.8	21.6	4.3	13.7	16	3.2	23.8
SS 1/10	CHGR (d)	57.0	11.4	45.5	22	4.4	44.9	109.0	21.8	69.3	38	7.6	56.7
	GRSP	19.5	3.9	15.6	3	0.6	6.1	10.6	2.1	6.7	3	0.6	4.5
	HIJA							4.0	0.8	2.6	6	1.2	9.0
	LYAN							11.0	2.2	7.0	1	0.2	1.5
	ORHY							0.1	0.2	0.1	1	0.2	1.5
	SPAM	5.5	1.1	4.4	5	1.0	10.2	1.0	0.2	0.6	2	0.4	3.0
		125.3	25.0	100.0	49	9.8	100.0	157.3	31.6	100.0	67	13.4	100.0
MX 181	CELA	4.5	0.9	3.2	4	0.8	13.3	4.5	0.9	3.7	3	0.6	10.4
SS 1/11	CHGR (d)	48.0	9.6	34.7	13	2.6	43.3	87.5	17.4	72.3	19	3.8	65.5
	EPNE (s)	29.0	5.8	20.9	5	1.0	16.8	10.0	2.0	8.3	2	0.4	6.8
	GRSP							9.0	1.8	7.4	3	0.6	10.4
	LYAN	30.0	6.0	21.7	4	0.8	13.3						
	TEAX	11.0	2.2	7.9	1	0.2	3.3						
	TEGL	16.0	3.2	11.6	3	0.6	10.0	9.5	1.9	7.9	1	0.2	3.4
	HIJA							0.5	0.1	0.4	1	0.2	3.4
		138.5	27.7	100.0	30	6.0	100.0	121.0	24.1	100.0	29	5.8	99.9
MX 181	ATSP (s)	10.6	2.1	14.9	6	1.2	16.7	35.1	7.0	30.9	19	3.8	29.2
SS 1/12	ATCA (d)	23.3	4.7	32.8	13	2.6	36.1	41.0	8.2	36.2	24	4.8	36.9
	CHGR	0.8	0.2	1.2	1	0.2	2.8	32.4	6.5	28.6	17	3.4	26.2
	GRSP	18.0	3.6	25.4	6	1.2	16.7						
	TEGL	1.7	0.3	2.4	1	0.2	2.8						
	TESP	5.0	1.0	7.0	1	0.2	2.8						
	HIJA	5.0	1.0	7.0	3	0.6	8.3						
	SIHY	0.6	0.1	0.8	2	0.4	5.6	0.4	0.1	0.4	1	0.2	1.5
	SPAM	6.0	1.2	8.5	3	0.6	8.3	4.5	0.9	4.0	4	0.8	6.2
		71.0	14.2	100.0	36	7.2	100.1	113.4	22.7	100.1	65	13.0	100.0

TABLE E-1 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ATSP	18.0	3.6	13.8	10	2.0	16.1						
SS 1/13	CELA (s)	61.6	12.3	47.2	30	6.0	48.4	10.0	2.0	7.0	5	1.0	14.7
	CHGR (d)	50.0	10.0	38.3	21	4.2	33.9	56.6	11.3	39.4	15	3.0	44.1
	GRSP							21.0	4.2	14.6	4	0.8	11.8
	TEGL							54.0	10.8	37.6	6	1.2	17.6
	HIJA							1.7	0.3	1.2	3	0.6	8.8
	ORHY							0.5	0.1	0.3	1	0.2	2.9
	SPAM	1.0	0.2	0.8	1	0.2	1.6						
		130.6	26.1	100.1	62	12.4	100.0	143.8	28.7	100.1	34	6.8	99.9
MX 181	ATSP	12.5	2.5	11.3	10	2.0	16.1	13.2	2.6	15.1	18	3.6	23.6
SS 1/14	ATCA (d)	18.8	3.8	17.0	11	2.2	17.7	50.5	10.1	57.8	30	6.0	39.4
	CELA (s)	35.1	7.0	31.8	17	3.4	27.4	21.3	4.3	24.4	18	3.6	23.6
	CHGR	39.7	7.9	35.9	17	3.4	27.4						
	ORHY	0.8	0.2	0.7	1	0.2	1.6	2.3	0.5	2.6	2	0.4	2.6
	SPAM	3.6	1.7	3.3	6	1.2	9.7				8	1.6	10.8
		110.5	23.1	100.0	62	12.4	99.9	87.3	17.5	99.9	76	15.2	100.0
MX 181	ATSP	20.6	4.1	14.4	7	1.4	9.9	18.6	3.7	11.8	8	1.6	12.7
SS 1/15	CELA (d)	86.5	17.3	60.4	43	8.6	60.6	116.2	23.3	73.6	44	8.8	69.8
	CHGR (s)	36.0	7.2	25.2	21	4.2	29.6	23.0	4.6	14.6	11	2.2	17.5
		143.1	28.6	100.0	71	14.2	100.1	157.8	31.6	100.0	63	12.6	100.0
MX 181	ATSP	10.5	2.1	7.0	4	0.8	4.6	11.3	2.3	9.4	6	1.2	8.7
SS 1/16	ATCO (s)	32.9	6.5	22.0	16	3.2	18.4	50.5	10.1	41.9	22	4.4	31.9
	CELA	10.5	2.1	7.0	3	0.6	3.4	7.7	1.5	6.4	5	1.0	7.2
	CHGR (d)	72.2	14.4	48.4	21	4.2	24.1	34.4	6.9	28.5	15	3.0	21.7
	HIJA	13.2	2.6	8.8	35	7.0	40.2	7.1	1.4	5.9	15	3.0	21.7
	ORHY	6.0	1.2	4.0	4	0.8	4.6	9.1	1.8	7.4	5	1.0	7.2
	SPAM	4.0	0.8	2.7	4	0.8	4.6	0.5	0.1	0.4	1	0.2	1.5
		149.3	29.7	99.9	87	17.4	99.9	120.6	24.1	99.9	69	13.8	99.9
MX 181	ATSP	11.5	2.3	7.7	10	2.0	12.5	18.9	3.8	15.4	11	2.2	15.1
SS 1/17	ATCO	13.7	2.7	9.2	6	1.2	7.5	15.5	3.1	12.6	7	1.4	9.6
	CELA (s)	51.1	10.2	34.4	31	6.2	38.8	46.8	9.4	38.2	26	5.2	35.6
	CHGR (d)	69.9	14.0	47.1	32	6.4	40.0	31.2	6.2	25.4	11	2.2	15.1
	HIJA							8.7	1.7	7.1	16	3.2	21.9
	ORHY	2.2	0.4	1.5	1	0.2	1.3	0.5	0.1	0.4	1	0.2	1.4
	SPAM							1.0	0.2	0.8	1	0.2	1.4
		148.4	29.6	99.9	80	16.0	100.1	122.6	24.5	99.9	3	14.6	00.1

TABLE E-1 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181	ATSP	9.0	1.8	8.0	4	0.8	10.0	11.0	2.2	7.3	5	1.0	8.5
SS 1/18	ATCA							7.0	1.4	4.6	2	0.4	3.4
	CELA (s)	19.0	3.8	16.0	9	1.8	22.5	69.4	13.9	45.8	32	6.4	54.2
	CHGR (d)	77.0	15.4	64.7	22	4.4	55.0	28.3	5.7	18.7	11	2.2	18.6
	GRSP	13.0	2.6	10.9	3	0.6	7.5	33.0	6.6	21.8	6	1.2	10.2
	ORHY							0.8	0.2	0.5	1	0.2	1.7
	SPAM	1.0	0.2	0.8	2	0.4	5.0	2.0	0.4	1.3	2	0.4	3.4
		119.0	23.8	100.4	40	8.0	100.0	151.5	30.4	100.0	59	11.8	100.0
MX 181	CELA	7.6	1.5	4.5	6	1.2	12.5	2.0	0.4	2.7	1	0.2	4.5
SS 1/19	CHGR (d)	91.7	18.3	54.8	29	5.8	60.4	38.0	7.6	51.4	13	2.6	59.1
	EPNE							8.0	1.6	10.8	2	0.4	9.1
	GRSP (s)	39.0	7.8	23.3	7	1.4	14.6	7.0	1.4	9.5	2	0.4	9.1
	LYAN	2.0	0.4	1.2	1	0.2	2.1	9.0	1.8	12.2	3	0.6	13.6
	TEAX	27.0	5.4	16.1	5	1.0	10.4	10.0	2.0	13.5	1	0.4	4.5
		167.3	36.4	99.9	48	9.6	100.0	74.0	14.8	100.1	22	4.6	99.9
MX 181	ARSP	26.7	5.3	18.4	12	2.4	14.8						
SS 1/20	CELA (s)	30.4	6.1	20.9	31	6.2	38.3	1.7	0.3	1.1	1	0.2	1.4
	CHGR	20.2	4.0	13.9	15	3.0	18.5	49.5	9.9	32.7	27	5.4	38.6
	GRSP (d)	56.6	11.3	39.1	8	1.6	9.9	45.4	9.1	30.0	27	5.4	38.6
	ERPU	2.7	0.5	1.9	6	1.2	7.4	52.5	10.5	34.7	8	1.6	11.4
	HIJA	5.2	1.0	3.6	8	1.6	9.9	0.8	0.2	0.5	2	0.4	2.9
	ORHY	3.5	0.7	2.4	1	0.2	1.2	1.6	0.3	1.1	5	1.0	7.1
		145.3	28.9	100.2	81	16.2	100.0	151.5	30.3	100.1	70	14.0	100.0
MX 181	ATCA	4.5	0.9	3.2	2	0.4	3.4	12.0	2.4	10.2	4	0.8	8.0
SS 1/21	CELA (s)	43.7	8.7	31.1	22	4.4	37.3	51.5	10.3	43.9	26	5.2	52.0
	CHGR (d)	58.2	11.6	41.5	23	4.6	39.0	48.7	9.7	41.5	18	3.6	36.0
	GRSP	29.5	5.9	21.0	5	1.0	8.5	5.2	1.0	4.4	2	0.4	4.0
	HIJA	3.6	0.7	2.6	5	1.0	8.5						
	SPAM	0.9	1.8	0.6	2	0.4	3.4						
		140.4	29.6	100.0	59	11.8	100.1	117.4	23.4	100.0	50	10.0	100.0
MX 181	ARSP	1.0	0.2	1.9	1	0.2	2.9	21.4	4.3	13.3	13	2.6	28.3
SS 1/22	CELA							6.8	1.4	4.2	4	0.8	8.7
	CHGR (s)	7.5	1.5	14.2	20	4.0	58.8	28.3	5.7	17.6	13	2.6	28.3
	EPNE (s)	9.0	1.8	17.0	1	0.2	2.9	24.5	4.9	15.2	3	0.6	6.5
	GRSP (d)	32.0	6.4	60.4	9	1.8	26.5	74.0	14.8	46.0	12	2.4	26.0
	LYAN							6.0	1.2	3.7	1	0.2	2.2
	ORHY	2.0	0.4	3.8	2	0.4	5.9						
	AM	1.5	0.3	2.8	1	0.2	2.9						
		53.0	10.6	100.1	34	6.8	99.9	161.0	32.3	100.0	46	9.2	100.0

TABLE E-1 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Transect 2 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ATCA (s)	14.9	3.0	8.9	5	1.0	7.5	32.5	6.5	18.3	8	1.6	12.5
SS 1/23	CELA	9.8	2.0	5.8	7	1.4	10.5	9.0	1.8	5.1	8	1.6	12.5
	CHGR(d)	126.5	25.3	75.4	47	9.4	70.2	133.3	26.7	75.0	47	9.4	73.4
	GRSP	13.5	2.7	8.1	3	0.6	4.5						
	HIJA	3.1	0.6	1.8	5	1.0	7.5						
	ORHY							3.0	0.6	1.7	1	0.2	1.6
		167.8	33.6	100.0	67	13.4	100.2	177.8	35.6	100.1	64	12.8	100.0

TABLE E-2
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 2

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181 SS 2/1	CELA	9.0	2.0	10.3	4	0.8	5.3	3.5	0.7	3.3	3	0.6	8.6
	CHGR	11.5	2.3	13.2	5	1.0	6.7	4.9	1.0	4.6	3	0.6	8.6
	GRSP(d)	37.5	7.5	43.1	6	1.2	8.0	53.8	10.8	51.0	8	1.6	22.9
	LYAN(s)	10.0	2.0	11.5	2	0.4	2.7	28.0	5.6	26.5	3	0.6	8.6
	HIJA	16.1	3.2	18.5	51	10.2	68.0	9.3	1.9	8.8	12	2.4	34.3
	ORHY	2.5	0.5	2.9	2	0.4	2.7	3.0	0.6	2.8	4	0.8	11.4
	SPAM	0.5	0.1	0.6	5	1.0	6.7	3.0	0.6	2.8	2	0.4	5.7
		87.1	17.6	100.1	75	15.0	100.1	105.5	21.2	99.8	35	7.0	100.1
MX 181 SS 2/2	ATCA							6.0	1.2	7.7	1	0.2	3.6
	CHGR(s)	11.0	2.2	12.0	3	0.6	6.8	28.0	5.6	35.8	7	1.4	25.0
	EPNE	8.0	2.0	8.7	2	0.4	4.6	6.0	1.2	7.7	1	0.2	3.6
	GRSP(d)	50.3	10.1	54.7	9	1.8	20.5	18.0	3.6	23.0	3	0.6	10.7
	LYAN	8.0	1.6	8.7	1	0.2	2.3						
	YUBR							13.0	2.6	16.6	1	0.2	3.4
	HIJA	11.2	2.2	12.2	26	5.2	59.1	6.2	1.2	7.9	14	2.8	50.0
	ORHY	3.5	0.7	3.8	3	0.6	6.8	1.0	0.2	1.3	1	0.2	3.6
		92.0	18.8	100.1	44	8.8	100.1	78.2	15.6	100.0	28	5.6	99.9
MX 181 SS 2/3	CELA	57.8	11.6	40.3	31	6.2	44.9	3.5	7.0	2.8	1	0.2	2.9
	CHGR(s)	19.5	3.9	13.6	7	1.4	10.1	50.4	10.1	40.3	11	2.2	32.4
	GRSP(d)	54.0	10.8	37.7	6	1.2	8.7	61.0	12.2	48.8	9	1.8	26.5
	HIJA	12.1	2.4	8.4	25	5.0	36.2	4.5	0.9	3.6	8	1.6	23.5
	ORHY							2.7	0.5	2.2	3	0.6	8.8
	SPCR							3.0	0.6	2.4	2	0.4	5.9
		143.4	28.7	100.0	69	13.8	99.9	125.1	31.3	100.1	34	6.8	100.0
MX 181 SS 2/4	ARSP(d)	40.0	8.0	32.6	15	3.0	28.3	22.5	4.5	21.4	8	1.6	13.8
	CELA	30.5	6.1	24.8	18	3.6	34.0	9.5	1.9	9.0	7	1.4	12.1
	CHGR(s)	36.0	7.2	29.3	10	2.0	18.9	9.0	1.8	8.6	2	0.4	3.5
	GRSP	6.0	1.2	4.9	1	0.2	1.9	43.0	8.6	40.9	7	1.4	12.1
	SY							7.0	1.4	6.7	1	0.2	1.7
	HIJA	0.8	0.2	0.7	2	0.4	3.8	13.2	2.6	12.6	31	6.2	53.5
	ORHY	2.0	4.0	1.6	1	0.2	1.9						
	SIHY	1.0	0.2	0.8	1	0.2	1.9						
	SPAM	3.5	0.7	2.7	4	0.8	7.6	1.0	0.2	1.0	2	0.4	3.5
	SPCR	3.0	0.6	2.4	1	0.2	1.9						
		122.8	28.2	99.8	53	10.6	100.2	105.2	21.0	100.2	58	11.6	100.2

TABLE E-2 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	CELA	3.5	0.7	2.7	3	0.6	5.2	31.5	6.3	24.0	14	2.8	15.4
SS 2/5	CHGR	12.0	2.4	9.4	4	0.8	6.9	12.5	2.5	9.5	6	1.2	6.6
	LYAN	24.5	4.9	19.2	2	0.4	3.5						
	TEGL(d)	60.0	12.0	47.0	8	1.6	13.8	51.5	10.3	39.3	8	1.6	8.8
	HLJA(s)	25.8	5.2	20.2	40	8.0	69.0	35.6	7.1	27.2	63	12.6	69.2
	ORHY	2.0	0.4	1.6	1	0.2	1.7						
		127.8	25.6	100.1	58	11.6	100.1	131.1	26.2	100.0	91	18.2	100.0
MX 181	CELA(d)	170.5	34.1	99.0	70	1.4	95.9	153.4	30.7	97.8	44	8.8	93.6
SS 2/6	ATSP(s)							3.0	0.6	1.9	1	0.2	2.1
	HLJA	1.7	0.3	1.0	3	0.6	4.1	0.5	0.1	0.3	2	0.4	4.3
		172.2	34.4	100.0	73	2.0	100.0	156.9	31.4	100.0	47	9.4	100.0
MX 181	ATSP	7.4	1.5	7.7	6	1.2	10.7	0.5	0.1	0.6	1	0.2	1.7
SS 2/7	CELA(s)	34.7	6.9	36.0	14	2.8	25.0	20.0	4.0	21.9	16	3.2	27.6
	CHGR(d)	23.0	4.6	23.9	6	1.2	10.7	36.1	7.2	39.5	17	3.4	29.3
	GRSP	4.0	0.8	4.2	2	0.4	3.6	0.2	0.0	0.2	1	0.2	1.7
	LYAN	14.0	2.8	14.5	1	0.2	1.8	6.0	1.2	6.6	1	0.2	1.7
	TEGL							14.0	2.8	15.3	2	0.4	3.5
	OPPU							1.0	0.2	1.1	1	0.2	1.7
	HLJA	13.3	2.7	13.8	27	5.4	48.2	7.7	1.5	8.4	13	2.6	22.4
	ORHY							5.8	1.2	6.4	6	1.2	10.3
		96.4	19.3	100.1	56	11.2	100.0	91.3	18.2	100.0	58	11.6	99.9
MX 181	ARSP(s)	70.5	14.1	49.1	29	5.8	43.3	0.5	0.1	0.4	1	0.2	2.2
SS 2/8	ATCA							11.0	2.2	9.6	4	0.8	8.7
	CELA(d)	73.0	14.6	50.9	38	7.6	56.7	37.8	7.6	33.1	14	2.8	30.4
	CHGR							65.0	13.0	56.9	27	5.4	58.7
		143.5	28.7	100.0	67	13.4	100.0	114.3	22.9	100.0	46	9.2	100.0
MX 181	CELA(d)	108.0	21.6	93.9	47	9.4	78.3	135.6	27.1	94.0	57	11.4	90.5
SS 2/9	CHGR(s)							7.5	1.5	5.2	2	0.4	3.2
	SPCR	7.0	1.4	6.1	13	2.6	21.7	1.2	0.2	0.8	4	0.8	6.3
		115.0	23.0	100.0	60	12.0	100.0	144.3	28.8	100.0	63	12.6	100.0

TABLE E-2 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Dens. (%)
MX 181 SS 2/10	ARSP							2.5	0.5	2.4	1	0.2	1.8
	ATCA							3.3	0.7	3.2	3	0.6	5.3
	ATCO(s)	19.6	3.9	15.6	16	12.6	19.8	13.3	2.7	12.9	9	1.8	15.8
	CELA(d)	103.9	20.8	82.8	63	3.2	77.8	81.8	16.4	79.5	41	8.2	71.9
	ORHY	2.0	0.4	1.6	2	0.4	2.5	2.0	0.4	1.9	3	0.6	5.3
		125.5	25.1	100.0	81	16.2	100.1	102.9	20.7	99.9	57	11.4	100.1
MX 181 SS 2/11	ARSP(s)	14.8	3.0	11.1	7	1.4	8.4	40.4	8.1	23.8	20	4.0	20.2
	CELA(d)	43.1	8.6	32.3	24	4.8	28.9	103.2	20.6	60.7	57	11.4	57.6
	GRSP	7.5	0.3	5.6	1	0.2	1.2	10.0	2.0	5.9	2	0.4	2.0
	TEGL	11.0	2.2	8.2	2	0.4	2.4	3.0	0.6	1.8	1	0.2	1.0
	CHGR	15.9	3.2	11.9	9	1.8	10.8						
	LYAN	3.5	0.7	2.6	1	0.2	1.2						
	TEAX	12.0	2.4	9.0	1	0.2	1.2						
	ERMI	1.5	0.3	1.1	1	0.2	1.2						
	HIJA	22.1	4.4	16.5	34	6.8	41.0	8.9	1.8	5.2	13	2.6	13.1
	EU	2.0	0.4	1.5	2	0.4	2.4						
	ERPU	0.2	0.0	0.1	1	0.2	1.2						
	MA							0.5	0.1	0.3	1	0.2	1.0
	ORHY							4.0	0.8	2.4	5	1.0	5.1
		133.6	25.5	99.9	83	16.6	99.9	170.0	34.0	100.1	99	19.8	100.0
MX 181 SS 2/12	ATCO(d)	50.2	10.0	37.1	25	5.0	37.9	74.4	14.9	52.5	30	6.0	54.6
	CELA(d)	85.2	17.0	62.9	41	8.2	62.1	67.3	13.5	47.5	25	5.0	45.5
		135.4	27.1	100.0	66	13.2	100.0	141.7	28.4	100.0	55	11.0	100.1
MX 181 SS 2/13	ATSP(s)	20.0	4.0	30.2	9	1.8	22.0	1.0	0.2	5.6	1	0.2	9.1
	ATCO(d)	28.7	5.7	43.3	16	3.2	39.0	9.4	1.9	52.2	3	0.6	27.3
	CELA(s)	13.5	2.7	20.4	9	1.8	22.0	7.0	1.4	38.9	4	0.8	36.4
	SPCR	4.1	0.8	6.2	7	1.4	17.1	0.6	0.1	3.3	3	0.6	27.3
		66.3	13.2	100.1	41	8.2	100.1	18.0	3.6	100.0	11	2.2	100.1

TABLE E-2 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Density	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Dens. (%)
MX 181	ATCO(s)	10.8	2.2	4.7	4	0.8	9.5	10.0	2.0	12.8	4	0.8	18.2
SS 2/14	SAVE(d)	217.7	43.5	95.3	38	7.6	90.5	68.0	13.6	87.2	18	3.6	31.8
		228.5	45.7	100.0	42	8.4	100.0	78.0	15.6	100.0	22	4.4	100.0
MX 181	CELA(d)	106.0	21.2	88.3	47	9.4	64.4	99.9	20.0	90.0	37	7.4	60.7
SS 2/15	HIJA(s)	12.0	2.4	10.0	23	4.6	31.5	11.1	2.2	10.0	24	4.8	39.3
	SP	2.0	0.4	1.7	3	0.6	4.1						
		120.0	24.0	100.0	73	14.6	100.0	111.0	22.2	100.0	61	12.2	100.0
MX 181	ATCO(d)	59.2	11.8	69.9	18	3.6	51.4	41.6	8.3	37.9	13	2.6	22.4
SS 2/16	CELA(s)	7.3	1.5	8.6	4	0.8	11.4	47.8	9.6	43.5	26	5.2	44.8
	KOAM	12.7	2.5	15.0	10	2.0	28.6	19.4	3.9	17.7	18	3.6	31.0
	SIHY	5.5	1.1	6.5	3	0.6	8.6	1.0	0.2	0.9	1	0.2	1.7
		84.7	16.9	100.0	35	7.0	100.0	109.8	22.0	100.0	58	11.6	99.9
MX 181	ATCO(d)	69.3	13.9	87.1	24	4.8	77.4	42.0	8.4	67.4	21	4.2	67.7
SS 2/17	CELA							5.0	1.0	8.0	2	0.4	6.5
	KOAM(s)	9.0	1.8	11.3	6	1.2	19.4	15.3	3.1	24.6	8	1.6	25.8
	SIHY	1.3	0.3	1.6	1	0.2	3.2						
		79.6	16.0	100.0	31	6.2	100.0	62.3	12.5	100.0	31	6.2	100.0
MX 181	ATSP	22.3	4.5	15.6	11	2.2	11.7						
SS 2/18	CELA(d)	95.4	19.1	66.6	53	10.6	56.4	117.6	23.5	67.2	47	9.4	66.2
	CHGR	2.5	0.5	1.8	2	0.4	2.1						
	ATCO(s)							51.8	10.4	29.6	19	3.8	26.8
	HIJA	2.3	0.5	1.6	7	1.4	7.5						
	MACA	15.1	3.0	10.5	15	3.0	16.0						
	ORHY	2.5	0.5	1.8	2	0.4	2.1	3.8	0.8	2.2	3	0.6	4.2
	SIHY							1.3	0.3	0.7	1	0.2	1.4
	SP	3.1	0.6	2.2	4	0.8	4.3	0.5	0.1	0.3	1	0.2	1.4
		143.2	28.7	100.1	94	18.8	100.1	175.0	35.1	100.0	71	14.2	100.0

TABLE E-2 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ARSP	8.2	1.6	5.7	3	0.6	4.5						
SS 2/19	CELA(d)	136.6	27.3	94.3	63	12.6	95.5	53.1	10.6	37.0	21	4.2	47.7
	CHGR(s)							90.3	18.1	63.0	23	4.6	52.3
		144.8	28.9	100.0	66	13.2	100.0	143.4	28.7	100.0	44	8.8	100.0
MX 181	ARSP(s)	16.1	3.2	12.4	7	1.4	10.6						
SS 2/20	CELA(d)	113.9	22.8	87.6	59	11.8	89.4	119.0	23.8	95.7	51	10.2	96.2
	CHGR							5.3	1.1	4.3	2	0.4	3.8
		130.0	26.0	100.0	66	13.2	100.0	124.3	24.9	100.0	53	10.6	100.0
MX 181	ATCO(d)	30.3	6.1	38.9	19	3.8	27.1	30.1	6.0	37.2	15	3.0	20.8
SS 2/21	CELA(s)	25.2	5.0	32.4	18	3.6	25.7	26.0	5.2	32.1	15	3.0	20.8
	HIJA(s)	19.7	3.9	25.3	29	5.8	41.4	20.8	4.2	25.7	36	7.2	50.0
	ORHY	1.0	0.2	1.3	2	0.4	2.9	0.9	0.2	1.1	2	0.4	2.8
	SPCR							3.2	0.6	4.0	4	0.8	5.6
	ARSP	1.7	0.3	2.2	2	0.4	2.9						
		77.9	15.5	100.1	70	14.0	100.0	81.0	16.2	100.1	72	14.4	100.0
MX 181	LYAN							4.1	0.8	4.7	1	0.2	2.5
SS 2/22	ARSP	1.4	0.3	1.9	1	0.2	2.8						
	CELA	6.8	1.4	9.0	7	1.4	19.4	2.3	0.5	2.7	2	5.0	5.0
	CHVI(d)	40.4	8.1	53.7	15	3.0	41.7	68.6	13.7	79.2	24	4.8	60.0
	EPNE(s)	15.4	3.1	20.5	4	0.8	11.1	1.8	0.4	2.1	2	0.4	5.0
	GRSP	8.0	1.6	10.6	2	0.4	5.6	2.0	0.4	2.3	1	0.2	2.5
	HIJA	3.2	0.6	4.3	7	1.4	19.5	7.8	1.6	9.0	10	2.0	25.0
		75.2	15.1	100.0	36	7.2	100.1	86.6	17.4	100.0	40	12.6	99.0
MX 181	ATCA							1.0	0.2	2.4	1	0.2	8.3
SS 2/23	AMER							10.9	2.2	26.0	4	0.8	33.3
	CHNA(s)							30.0	6.0	71.6	7	1.4	58.3
	CELA(d)	36.7	7.3	70.0	28	5.6	57.1						
	CHGR	2.0	0.4	3.8	1	0.2	2.0						
	EPNE	3.5	0.7	6.7	1	0.2	2.0						
	HIJA	10.2	2.0	19.5	19	3.8	38.8						
		52.4	10.4	100.0	49	9.8	99.9	41.9	8.4	100.0	12	2.4	99.9

TABLE E-3
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 3

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ARTR (d)	114.9	23.0	72.9	22	4.4	59.5	113.8	22.8	73.1	24	4.8	63.2
SS 3/1	CHVI (s)	43.4	8.7	27.4	15	3.0	40.5	30.3	6.1	19.4	11	2.2	29.0
	EPNE							2.5	0.5	1.6	1	0.2	2.6
	CHGR							9.0	1.8	5.8	2	0.4	5.3
		158.3	31.7	100.3	37	7.4	100.0	155.6	31.2	99.9	38	7.6	100.1
MX 181	ARTR (d)	47.6	9.5	46.0	11	2.2	42.3	80.5	16.1	53.3	19	3.8	59.3
SS 3/2	CHGR (s)	46.4	9.3	44.8	12	2.4	46.2	29.7	5.9	19.7	7	1.4	21.8
	EPNE	6.0	1.2	5.8	2	0.4	7.7	40.9	8.2	27.1	6	1.2	18.7
	TEGL	3.5	0.7	3.4	1	0.2	3.9						
		103.5	20.7	100.0	26	5.2	100.1	151.1	30.2	100.1	32	6.4	99.8
MX 181	ARTR (d)	98.6	19.7	90.8	13	2.6	86.7	42.3	8.5	47.4	8	1.6	47.0
SS 3/3	CHVI	6.0	1.2	5.5	1	0.2	6.7	6.0	1.2	6.7	2	0.4	11.8
	CHNA (s)							34.0	6.8	38.1	5	1.0	29.4
	CHGR	4.0	0.8	3.7	1	0.2	6.7						
	EPNE							7.0	1.4	7.8	2	0.4	11.8
		108.6	21.7	100.0	15	3.0	100.1	89.3	17.9	100.0	17	3.4	100.0
MX 181	CELA							6.9	1.4	6.1	4	0.8	7.8
SS 3/4	CHGR (d)	43.3	8.7	52.9	19	3.8	37.3	78.5	15.7	69.7	37	7.4	72.5
	GRSP							19.0	3.8	16.9	5	1.0	9.8
	LYAN							3.0	0.6	2.7	1	0.2	2.0
	TEGL (s)	33.6	6.7	41.1	5	1.0	9.8	4.5	0.9	4.0	1	0.2	2.0
	HIJA	4.9	1.6	6.0	27	5.4	52.9	0.8	0.2	0.7	3	0.6	5.9
		81.8	17.0	100.0	51	10.2	100.0	112.7	22.6	100.1	51	10.2	100.0
MX 181	ARTR (d)	135.6	27.1	91.7	25	5.0	89.3	82.6	16.5	77.1	18	3.6	69.2
SS 3/5	CHVI (s)	5.4	1.1	3.7	2	0.4	7.1	17.5	3.5	16.3	6	1.2	23.1
	EPNE							3.0	0.6	2.8	1	0.2	3.9
	GRSP							4.0	0.8	3.7	1	0.2	3.9
	TEGL	6.9	1.4	4.7	1	0.2	3.6						
		147.9	29.6	100.1	28	5.6	100.0	107.1	21.4	99.9	26	5.2	100.1
MX 181	ARTR (d)	78.2	15.6	79.6	19	3.8	73.1	32.5	6.5	52.8	23	4.6	67.6
SS 3/6	CHVI (s)	14.0	2.8	14.3	5	1.0	19.2	18.1	3.6	29.4	10	2.0	29.4
	LYAN							11.0	2.2	17.9	1	0.2	2.9
	TEGL	5.0	1.0	5.1	1	0.2	3.9						
	ORHY	1.0	0.2	1.0	1	0.2	3.9						
		98.2	19.6	100.0	26	5.2	100.1	61.6	12.3	100.1	34	6.3	99.9

TABLE E-3 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Dens. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Dens. (%)
MX 181	ARTR (d)	57.5	11.5	51.0	16	3.2	47.1	92.1	18.4	74.3	21	4.2	72.4
SS 3/7	CH (s)	53.4	10.7	47.4	17	3.4	50.0	16.5	3.3	13.3	4	0.8	13.8
	EPNE	1.8	0.4	1.6	1	0.2	2.9	15.3	3.1	12.3	4	0.8	13.8
		112.7	22.6	100.0	34	6.8	100.0	123.9	24.8	99.9	29	5.8	100.0
MX 181	ARTR (d)	50.0	10.0	78.7	20	4.0	80.0	26.0	5.2	24.6	5	1.0	18.5
SS 3/8	CHVI (s)	8.0	1.6	12.6	3	0.6	12.0	41.0	8.2	38.7	11	2.2	40.7
	EPNE							6.0	1.2	5.7	1	0.2	3.7
	GRSP	0.5	0.1	0.8	1	0.2	4.0	22.4	4.5	21.2	7	1.4	25.9
	LYAN							1.0	0.2	0.9	1	0.2	3.7
	OPER	5.0	1.0	7.9	1	0.2	4.0	9.5	1.9	9.0	2	0.4	7.4
		63.5	12.7	100.0	25	5.0	100.0	105.9	21.2	100.1	27	5.4	99.9
MX 181	ARTR (d)	89.1	17.8	63.6	17	3.4	58.6	119.7	23.9	95.9	27	5.4	90.0
SS 3/9	CHVI (s)	29.6	5.9	21.1	6	1.2	20.7	2.5	0.5	2.0	2	0.4	6.6
	EPNE	5.0	1.0	3.6	1	0.2	3.5	2.6	0.5	2.1	1	0.2	3.3
	GRSP	15.0	3.0	10.7	4	0.8	13.8						
	LYAN	1.5	0.3	1.1	1	0.2	3.5						
		140.2	28.0	100.1	29	5.8	100.1	124.8	24.9	100.0	30	6.0	100.0
MX 181	ARTR (d)	69.0	13.8	73.2	14	2.8	58.3	84.3	16.9	64.9	19	3.8	59.4
SS 3/10	CHVI (s)	16.3	3.3	17.3	8	1.6	33.3	31.0	6.2	23.9	8	1.6	25.0
	EPNE	2.5	0.5	2.7	1	0.2	4.2	13.8	2.8	10.6	4	0.8	12.5
	GRSP	6.5	1.3	6.9	1	0.2	4.2	0.8	0.2	0.6	1	0.2	3.1
		94.3	18.9	100.1	24	4.8	100.0	129.9	26.1	100.0	32	6.4	100.0
MX 181	CHGR (d)	64.4	12.9	47.1	17	3.4	56.7	46.5	9.3	32.8	12	2.4	37.5
SS 3/11	EPNE	24.2	4.8	17.7	5	1.0	16.7	10.5	2.1	7.4	2	0.4	6.3
	GRSP (s)	11.2	2.2	8.2	3	0.6	10.0	67.1	13.4	47.3	10	2.0	31.3
	LYAN	7.8	1.6	5.7	2	0.4	6.7	5.5	1.1	3.9	3	0.6	9.4
	TEGL	29.0	5.8	21.2	3	0.6	10.0	11.4	2.3	8.0	3	0.6	9.4
	HIJA							0.9	0.2	0.6	2	0.4	6.3
		136.6	27.3	99.9	30	6.0	100.1	141.9	28.4	100.0	32	6.4	100.2
MX 181	CELA	15.5	3.1	12.5	11	2.2	26.8	30.4	6.1	18.1	23	4.6	39.7
SS 3/12	CHGR (s)	46.3	9.3	37.3	16	3.2	39.0	31.8	6.4	18.9	13	2.6	22.4
	GRSP (d)	59.3	11.9	47.8	13	2.6	31.7	105.8			22		
	OPER	3.0	0.6	2.4	1	0.2	2.4		21.2	63.0		4.4	37.9
		124.1	24.9	100.0	41	8.2	99.9	168.0	33.7	100.0	58	11.6	100.0

TABLE E-3 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ARTR (d)	93.4	18.7	74.4	20	4.0	66.7	80.9	16.2	57.7	20	4.0	52.6
SS 3/13	CHVI (s)	15.3	3.1	12.2	4	0.8	13.3	27.0	5.4	19.3	7	1.4	18.4
	EPNE (s)	15.3	3.1	12.2	4	0.8	13.3	21.4	4.3	15.3	7	1.4	18.4
	LYAN	0.6	0.1	0.5	1	0.2	3.3	0.4	0.1	0.3	1	0.2	2.6
	TEGL	1.0	0.2	0.8	1	0.2	3.3	10.5	2.1	7.5	3	0.6	7.9
		125.6	25.2	100.1	30	6.0	99.9	140.2	28.1	100.1	38	7.6	99.9
MX 181	ARSP	2.0	0.4	1.4	2	0.2	2.7						
SS 3/14	ARTR (d)	94.1	18.8	64.1	19	3.8	51.4	119.0	23.8	76.9	20	4.0	64.5
	CHGR (s)	24.4	4.9	16.6	6	1.2	16.4	21.1	4.2	13.7	7	1.4	22.6
	EPNE	2.0	0.4	1.4	1	0.2	2.7	9.6	1.9	6.2	1	0.2	3.2
	GRSP	7.4	1.5	5.0	5	1.0	13.5	5.0	1.0	3.2	2	0.4	6.5
	LYAN	9.5	1.9	6.5	3	0.6	8.1						
	TEGL	5.8	1.2	4.0	1	0.2	2.7						
	ORHY	1.5	0.3	1.0	1	0.2	2.7						
	SIHY							1.8		1.2	1	0.2	3.2
		146.7	29.4	100.0	37	7.4	100.2	156.5	30.9	101.2	31	6.2	100.0
MX 181	CELA (d)	65.1	13.0	70.8	70	14.0	74.5	62.8	12.6	84.9	70	14.0	84.4
SS 3/15	ARSP							0.8	0.2	1.1	2	0.4	2.4
	CHGR (s)	16.4	3.3	17.8	10	2.0	10.6	7.9	1.6	10.7	6	1.2	7.2
	HIJA (s)	10.2	2.0	11.1	13	2.6	13.8	2.0	0.4	2.7	3	0.6	3.6
	ORHY	0.2	0.0	0.2	1	0.2	1.1	0.4	0.1	0.5	1	0.2	1.2
	SPAM							0.1	0.0	0.1	1	0.2	1.2
		91.9	18.3	99.9	94	18.8	100.0	74.0	14.9	100.0	83	16.6	100.0
MX 181	ARTR	15.0	3.0	8.4	2	0.4	4.6						
SS 3/16	CHVI (d)	104.2	20.8	58.1	23	4.6	52.3	99.8	20.0	70.8	25	5.0	71.4
	GRSP (s)	51.1	10.2	28.5	11	2.2	25.0	36.9	7.4	26.2	7	1.4	20.0
	LYAN	5.8	1.2	3.2	2	0.4	4.6	3.1	0.6	2.2	1	0.2	2.9
	TEGL							0.1	0.0	0.1	1	0.2	2.9
	ERPU	1.3	0.3	0.7	2	0.4	4.6						
	HIJA	2.0	0.4	1.1	4	0.8	9.1	1.0	0.2	0.7	1	0.2	2.9
		179.4	35.9	100.0	44	8.8	100.2	140.9	28.2	100.0	35	7.0	100.1

TABLE E-3 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Dens. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Dens. (%)
MX 181 3/17	ATCO (s)	56.2	11.2	46.8	24	4.8	42.9	37.8	7.6	35.6	12	2.4	40.0
	CELA	30.3	6.1	25.3	19	3.8	33.9	3.0	0.6	2.8	2	0.4	6.6
	CHGR (d)	33.5	6.7	27.9	13	2.6	23.2	65.3	13.1	61.6	16	3.2	53.3
		120.0	24.0	100.0	56	11.2	100.0	106.1	21.3	100.0	30	6.0	99.9
MX 181 3/18	ARSP	4.8	1.0	4.2	3	0.6	3.3						
	CELA (s)	22.6	4.5	19.7	14	2.8	15.2	18.0	3.6	15.8	16	3.2	22.8
	CHVI	4.0	0.8	3.5	1	0.2	1.1	25.9	5.2	22.7	7	1.4	10.0
	GRSP (d)	16.0	3.2	14.0	3	0.6	3.3	35.0	7.0	30.7	6	1.2	8.5
	LYAN	5.0	1.0	4.4	1	0.2	1.1	9.7	1.9	8.5	3	0.6	4.3
	TEAX	23.0	4.6	20.1	3	0.6	3.3	8.4	1.7	7.4	1	0.2	1.4
	TEGL							3.0	0.6	2.6	1	0.2	1.4
	ERPU							0.5	0.1	0.4	1	0.2	1.4
	HIJA (s)	32.7	6.5	28.6	61	12.2	66.3	9.0	1.8	7.9	31	6.2	44.3
	ORHY	5.8	1.2	5.1	4	0.8	4.3	2.7	0.5	2.4	2	0.4	2.9
	SIHY	0.6	0.1	0.5	2	0.4	2.2	1.5	0.3	1.3	1	0.2	1.4
	SPAM							0.3	0.1	0.3	1	0.2	1.4
		114.5	22.9	100.1	92	18.4	100.1	114.0	22.7	100.0	70	14.0	99.8
MX 181 3/19	ATCO	11.5	2.3	12.2	5	1.0	9.3						
	CELA (d)	45.8	9.2	48.7	25	5.0	46.3	48.7	9.7	73.5	31	6.2	59.6
	CHGR (s)	27.0	5.4	28.7	13	2.6	24.1						
	TEGL	1.5	0.3	1.6	1	0.2	1.9						
	HIJA	2.7	0.5	2.9	6	1.2	11.1	17.6	3.5	26.6	21	4.2	40.4
	ORHY	4.2	0.8	4.5	3	0.6	5.6						
	SPAM	1.3	0.3	1.4	1	0.2	1.9						
		94.0	18.8	100.0	54	10.8	100.2	66.3	13.2	100.1	52	10.4	100.0
MX 181 3/20	ATCA (d)	38.6	7.7	31.2	11	2.2	18.6	46.6	9.3	43.5	15	3.0	31.3
	CELA	15.4	3.1	12.4	11	2.2	18.6	21.5	4.3	20.1	10	2.0	20.8
	CH	4.0	0.8	3.2	2	0.4	3.4	13.0	2.6	12.1	5	1.0	10.4
	GRSP (s)	35.4	7.1	28.6	7	1.4	11.9	17.3	3.5	16.2	4	0.8	8.3
	HIJA	29.0	5.8	23.4	27	5.4	45.8	8.2	1.6	7.7	13	2.6	27.1
	ORHY	1.4	0.3	1.1	1	0.2	1.7	0.5	0.1	0.5	1	0.2	2.1
		123.8	24.8	99.9	59	11.8	100.0	107.1	21.4	100.1	48	9.6	100.0

TABLE E-3 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ATCA	27.8	5.6	20.4	6	1.2	9.5	27.5	5.5	25.0	11	2.2	23.4
SS 3/21	CELA (d)	45.1	9.0	33.1	18	3.6	28.6	27.5	5.5	25.0	12	2.4	25.5
	CH	8.6	1.7	6.3	2	0.4	3.2	2.0	0.4	1.8	1	0.2	2.1
	GRSP	12.7	2.5	9.3	2	0.4	3.2	29.0	5.8	26.3	4	0.8	8.5
	HIJA (s)	42.2	8.4	30.9	35	7.0	55.6	24.1	4.8	21.9	19	3.8	40.4
		136.4	27.2	100.0	63	12.6	100.1	110.1	22.0	100.0	47	9.4	99.9
MX 181	CELA (d)	67.5	13.5	46.4	37	7.4	57.8	55.1	11.0	46.9	22	4.4	38.6
SS 3/22	GRSP (s)	62.5	12.5	43.0	11	2.2	17.2	30.3	6.1	25.8	5	1.0	8.8
	HIJA	10.7	2.1	7.4	11	2.2	17.2	14.3	2.9	12.2	23	4.6	40.4
	ORHY	1.9	0.4	1.3	2	0.4	3.1	6.0	1.2	5.1	3	0.6	5.3
	SPAM	0.6	0.1	0.4	1	0.2	1.6						
	SPCR	2.0	0.4	1.4	2	0.4	3.1						
	CHGR							10.5	2.1	8.9	3	0.6	5.3
	ARSP							1.4	0.3	1.2	1	0.2	1.6
		145.2	29.0	99.9	64	12.8	100.0	117.6	23.6	100.1	57	11.4	100.0
MX 181	CELA (d)	78.9	15.8	86.8	59	11.8	51.3	94.4	18.9	87.4	53	10.6	67.1
SS 3/23	HIJA (s)	7.6	1.5	8.4	45	9.0	39.1	13.6	2.7	12.6	26	5.2	
	ORHY	4.4	0.9	4.8	11	2.2	9.6						32.9
		90.9	18.2	100.0	115	23.0	100.0	108.0	21.6	100.0	79	15.8	100.0

TABLE E-4
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 4

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181 SS 4/1	ARSP	0.1	0.0	0.1	1	0.2	1.7						
	ATCO(s)	31.4	6.3	34.4	23	4.6	39.0						
	CELA(d)	60.0	12.0	65.7	35	7.0	59.3	83.3	16.7	99.4	42	8.4	97.7
	ORHY							0.5	0.1	0.6	1	0.2	2.3
		91.5	18.3	100.2	59	11.8	100.0	83.8	16.8	100.0	43	8.6	100.0
MX 181 SS 4/2	SUFR							6.0	1.2	8.4	1	0.2	4.3
	ARSP	5.4	1.1	5.1	5	1.0	10.4						
	ATCO(s)	27.1	5.4	25.5	15	3.0	31.3	11.4	2.3	16.0	4	0.8	17.4
	KOAM(d)	42.2	8.4	39.8	17	3.4	35.4						
	SAVE(s)	29.4	5.9	27.7	9	1.8	18.8	15.1	3.0	21.2	5	1.0	21.7
	SIHY	2.0	0.4	1.9	2	0.4	4.2	1.5	0.3	2.1	1	0.2	4.3
	SUTO							37.3	7.5	52.3	12	2.4	52.2
		106.1	21.2	100.0	48	9.6	100.1	71.3	14.3	100.0	23	4.6	99.9
MX 181 SS 4/3	CHGR	6.2	1.2	7.2	4	0.8	5.3						
	ATCO(s)	8.1	1.6	9.4	6	1.2	8.0	74.8	15.0	97.5	27	5.4	87.1
	GUSA(d)	60.9	12.2	70.7	46	9.2	61.3	1.6	0.3	2.1	3	0.6	9.7
	HIJA	3.2	0.6	3.7	10	2.0	13.3						
	LEMO	0.3	0.1	0.4	1	0.2	1.3						
	ORHY	1.8	0.4	2.1	4	0.8	5.3						
	ERCA	5.5	1.1	6.4	3	0.6	4.0						
	KOAM	0.2	0.0	0.2	1	0.2	1.3	0.3	0.1	0.4	1	0.2	3.2
		86.2	17.2	100.1	75	15.0	99.8	76.7	15.4	100.0	31	6.2	100.0
MX 181 SS 4/4	CELA	6.8	1.4	8.2	8	1.6	11.8	4.1	0.8	4.1	5	1.0	7.1
	ARSP(s)	23.9	4.8	28.8	24	4.8	35.3	27.0	5.4	26.9	19	3.8	27.1
	ATCO(d)	35.7	7.2	43.1	21	4.2	30.9	59.9	12.0	59.7	37	7.4	52.9
	SIHY	0.3	0.1	0.4	1	0.2	1.5						
	CHGR	7.2	1.4	8.7	3	0.6	4.4	6.2	1.2	6.2	4	0.8	5.7
	ORHY	4.1	0.8	4.9	5	1.0	7.4						
	GU	3.0	0.6	3.6	2	0.4	2.9	1.5	0.3	1.5	1	0.2	1.4
	HIJA	1.5	0.3	1.8	2	0.4	2.9	0.8	0.2	0.8	2	0.4	2.9
	SPAM	0.4	0.1	0.5	2	0.4	2.9	0.9	0.2	0.9	2	0.4	2.9
		82.9	16.7	100.0	68	13.6	100.0	100.4	20.1	100.1	70	14.0	100.0

TABLE E-4 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181 SS 4/5	ATCA(s)	2.0	0.4	2.0	1	0.2	2.1	15.0	3.0	16.8	6	1.2	13.6
	CELA(s)	2.5	0.5	2.5	3	0.6	6.4	7.8	1.6	8.7	9	1.8	20.5
	CHGR(d)	88.0	17.6	86.6	35	7.0	74.5	65.2	13.0	72.9	25	5.0	56.8
	CRHY	6.1	1.2	6.0	7	1.4	14.8						
	TEGL	3.0	0.6	3.0	1	0.2	2.1						
	HIJA							1.4	0.3	1.6	4	0.8	9.1
		101.6	20.3	100.1	47	9.4	99.9	89.4	17.9	100.0	44	8.8	100.0
MX 181 SS 4/6	ARSP(s)	42.9	8.6	39.9	23	4.6	31.9	26.2	5.2	26.0	20	4.0	34.5
	ATCO(d)	35.1	7.0	32.7	17	3.4	23.6	35.8	7.2	35.6	19	3.8	32.8
	HIJA	8.4	1.7	7.8	16	3.2	22.2						
	CRHY	17.2	3.4	16.0	8	1.6	11.1	2.2	0.4	2.2	2	0.4	3.5
	SPAM	3.8	0.8	3.5	8	1.6	11.1						
	CHGR							22.4	4.5	22.2	10	2.0	17.2
	CELA							2.7	0.5	2.7	2	0.4	3.5
	TEGL							4.0	0.8	4.0	1	0.2	1.7
	KOAM							7.4	1.5	7.4	4	0.8	6.9
		107.4	21.5	99.9	72	14.4	99.9	100.7	20.1	100.1	58	11.6	100.1
MX 181 SS 4/7	ATCO	28.0	5.6	26.1	16	3.2	17.0	10.3	2.1	10.9	5	1.0	2.7
	ARSP	14.4	2.9	13.4	7	1.4	7.5	3.8	0.8	4.0	3	0.6	1.6
	CELA	9.5	1.9	8.9	5	1.0	5.3						
	CHGR(s)	25.9	5.2	24.1	18	3.6	19.2	15.5	3.1	16.4	17	3.4	9.2
	HIJA(d)	13.4	2.7	12.5	34	6.8	36.2	57.4	11.5	60.8	153	30.6	83.2
	CRHY	15.6	3.1	14.5	12	2.4	12.2	7.4	1.5	7.8	6	1.2	3.3
	SIHY	0.1	0.0	0.1	1	0.2	1.1						
	SPAM	0.4	0.1	0.4	1	0.2	1.1						
		107.3	21.5	100.0	94	18.8	99.6	94.4	19.0	99.9	184	36.8	100.0
MX 181 SS 4/8	ARTR	4.0	0.8	4.1	1	0.2	3.7						
	ARSP							5.2	1.0	4.5	6	1.2	10.7
	ATCO(d)	93.1	18.6	94.4	25	5.0	92.6	100.8	20.2	86.4	44	8.8	78.6
	CELA(s)							10.7	2.1	9.2	6	1.2	10.7
	SIHY	1.5	0.3	1.8	1	0.2	3.7						
		98.6	19.7	100.3	27	5.4	100.0	116.7	23.3	100.1	56	11.2	100.0

TABLE E-4 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181 SS 4/9	ATCA(d)	29.0	5.8	39.8	9	1.8	19.6	24.4	4.9	33.2	10	2.0	11.9
	CELA	22.5	4.5	30.9	15	3.0	32.6	4.8	1.0	6.5	6	1.2	7.1
	GU	6.7	1.3	9.2	1	0.2	2.2						
	ORHY(s)	7.5	1.5	10.3	10	2.0	21.7	41.8	8.4	56.8	60	12.0	71.4
	SIHY	7.2	1.4	9.9	11	2.2	23.9	1.2	0.2	1.6	1	0.2	1.2
	HIJA							1.4	0.3	1.9	7	1.4	8.3
		72.9	14.5	100.1	46	9.2	100.0	73.6	14.8	100.0	84	16.8	99.9
MX 181 SS 4/10	ATCO(d)	43.2	8.6	52.9	17	3.4	23.9	55.3	11.1	57.8	24	4.8	37.5
	CELA(s)	14.6	2.9	17.9	10	2.0	14.1	26.6	5.3	27.8	23	4.6	35.9
	HIJA(s)	0.2	0.0	0.2	1	0.2	1.4						
	ORHY	0.5	0.1	0.6	1	0.2	1.4						
	SIHY	23.2	4.6	28.4	42	8.4	59.1	13.8	2.8	14.4	17	3.4	26.6
		81.7	16.2	100.0	71	14.2	99.9	95.7	19.2	100.0	64	12.8	99.9
MX 181 SS 4/11	ARSP(s)	31.7	6.3	34.2	34	6.8	49.3	3.6	0.7	4.8	2	0.4	2.5
	ATCO(s)	21.5	4.4	23.2	13	2.6	18.8	19.3	3.9	25.6	15	3.0	19.0
	KOAM(d)	37.2	7.4	40.1	19	3.8	27.5	50.1	10.0	66.5	56	11.2	70.9
	ORHY	1.1	0.2	1.2	2	0.4	2.9	2.3	0.5	3.1	6	1.2	7.6
	SIHY	1.3	0.3	1.4	1	0.2	1.5						
		92.8	18.6	100.1	69	13.8	100.0	75.3	15.1	100.0	79	15.8	100.0
MX 181 SS 4/12	ATCA(s)	18.3	3.6	21.5	5	1.0	4.3	28.7	5.7	27.7	14	2.8	15.1
	CELA(d)	41.0	8.2	48.1	22	4.4	18.8	25.3	5.1	24.4	14	2.8	15.1
	HIJA	17.6	3.5	20.6	77	15.4	65.8	13.5	2.7	13.0	33	6.6	35.5
	ORHY	8.4	1.6	9.9	13	2.6	11.1	3.0	0.6	2.9	5	1.0	5.4
	SIHY							10.4	2.1	10.0	12	2.4	12.9
	GUSA							21.8	4.4	21.0	14	2.8	15.1
	CHGR							1.0	0.2	1.0	1	0.2	1.1
		85.3	16.9	100.1	117	23.4	100.0	113.7	20.8	100.0	93	18.6	100.2
MX 181 SS 4/13	ARTR	1.6	0.3	1.9	2	0.4	4.0						
	ATCO(s)	72.7	14.5	88.2	35	7.0	70.0						
	KOAM	6.1	1.2	7.4	5	1.0	10.0						
	SIHY	2.0	0.4	2.4	8	1.6	16.0	1.2	0.2	1.2	3	0.6	4.5
	CHGR(d)							87.7	17.5	90.0	44	8.8	66.7
	HIJA							6.7	1.3	6.9	17	3.4	25.8
	ORHY							1.8	0.4	1.9	2	0.4	3.0
		82.4	16.4	99.9	50	10.0	100.0	97.4	19.4	100.0	66	13.2	100.0

TABLE E-4 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181 SS 4/14	ATCO							72.7	14.5	88.2	35	7.0	70.0
	ARTR							1.6	0.3	1.9	2	0.4	4.0
	SIHY							2.0	0.4	2.4	8	1.6	16.0
	SUTO	1.2	0.2	1.2	3	0.6	4.5	6.1	1.2	7.4	5	1.0	10.0
	ORHY	1.8	0.4	1.8	2	0.4	3.0						
	CHGR	87.7	17.5	90.0	44	8.8	66.7						
	HIJA	6.7	1.3	6.9	17	3.4	25.8						
		97.4	19.4	99.9	66	13.2	100.0	82.4	16.4	99.9	50	10.0	100.0
MX 181 SS 4/15	ATCO	0.5	0.1	0.4	1	0.2	0.7						
	CELA(d)	72.7	14.4	64.8	46	9.2	34.1	88.2	17.6	94.7	51	10.2	86.4
	HIJA(s)	29.9	6.0	26.9	72	14.4	53.3						
	ORHY	0.2	0.0	0.2	1	0.2	0.7						
	SPCR	8.6	1.7	7.1	15	3.0	11.1	4.9	1.0	5.3	8	1.6	13.6
		111.9	22.2	99.4	135	27.0	99.9	93.1	18.6	100.0	59	11.8	100.0
MX 181 SS 4/16	ATCA	11.5	2.3	10.2	5	1.0	8.9	74.0	14.8	81.8	33	6.6	80.5
	ATCO(s)	0.5	0.1	0.5	1	0.2	1.8						
	CELA	7.7	1.5	6.9	4	0.8	7.1	2.3	0.5	2.5	4	0.8	9.8
	CHGR(d)	83.8	16.8	74.6	27	5.4	48.2						
	HIJA	1.9	0.4	1.7	6	1.2	10.7						
	ORHY	6.9	1.4	6.1	13	2.6	23.2						
	KOAM							12.2	2.4	13.5	3	0.6	7.3
	ARSP							2.0	0.4	2.2	1	0.2	2.4
		112.3	22.5	100.0	56	11.2	99.9	90.5	18.1	100.0	41	8.2	100.0
MX 181 SS 4/17	ARSP	1.7	0.3	1.3	2	0.4	3.8						
	ATCO(d)	110.9	22.2	87.0	39	7.8	73.6	116.5	23.3	93.4	44	8.8	89.8
	KOAM(s)	14.9	3.0	11.7	12	2.4	22.6	7.9	1.6	6.3	4	0.8	8.2
	SIHY							0.3	0.1	0.2	1	0.2	2.0
		127.5	25.5	100.0	53	10.6	100.0	124.7	25.0	99.9	49	9.8	100.0
MX 181 SS 4/18	ATCO(d)	19.1	3.8	90.1	23	4.6	63.9	59.8	12.9	56.0	26	5.2	44.1
	KOAM	0.2	0.0	0.9	1	0.2	2.8	10.1	2.0	9.5	13	2.6	22.0
	SIHY(s)	1.9	0.4	9.0	12	2.4	33.3	36.9	7.4	34.6	20	4.0	33.9
		21.2	4.2	100.0	36	7.2	100.0	106.8	21.4	100.1	59	11.8	100.0

TABLE E-4 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ARSP	0.5	0.1	0.6	1	0.2	2.6	0.3	0.1	0.4	1	0.2	5.9
SS 4/19	ATCO(d)	24.1	4.8	27.2	8	1.6	20.5	44.3	8.9	65.5	13	2.6	76.5
	KOAM(s)	35.9	7.2	40.6	21	4.2	53.9	23.0	4.6	34.0	3	0.6	17.6
	LYAN	5.8	1.2	6.6	1	0.2	2.6						
	SAVE	16.9	3.4	19.1	3	0.6	7.7						
	SIHY	5.3	1.1	6.0	5	1.0	12.8						
		88.5	17.8	100.1	39	7.8	100.1	67.6	13.6	99.9	17	3.4	100.0
MX 181	CELA(d)	91.5	18.3	98.0	68	13.6	95.8						
SS 4/20	ORHY	1.9	0.4	2.0	3	0.6	4.2						
	OPER							4.0	0.8	38.1	1	0.2	25.0
	GUSA(s)							6.5	1.3	61.9	3	0.6	75.0
		93.4	18.7	100.0	71	14.2	100.0	10.5	2.1	100.0	4	0.8	100.0
MX 181	ATCA(d)	28.5	5.7	32.8	5	1.0	16.1	53.5	10.7	60.9	20	4.0	37.0
SS 4/21	ATCO(s)	32.3	6.5	37.1	9	1.8	29.0						
	CELA	2.0	0.4	2.3	1	0.2	3.2						
	KOAM(s)	15.4	3.1	17.7	10	2.0	32.3	14.3	2.9	16.3	13	2.6	24.1
	GUMI	4.8	1.0	5.5	2	0.4	6.5	5.4	1.1	6.2	2	0.4	3.7
	SIHY	4.0	0.8	4.6	4	0.8	12.9	14.6	2.9	16.6	19	3.8	35.2
		87.0	17.5	100.0	31	6.2	100.0	87.8	17.6	100.0	54	10.8	100.0
MX 181	ATCA							22.0	4.4	19.7	10	2.0	22.7
SS 4/22	CELA							5.7	1.1	5.1	3	0.6	6.8
	ATCO(s)	50.6	10.1	87.4	20	4.0	74.1						
	KOAM	1.5	0.3	2.6	1	0.2	3.7						
	SIHY	5.8	1.2	10.0	6	1.2	22.2						
	CHGR(d)							70.7	14.1	63.3	21	4.2	47.7
	TEGL							7.6	1.5	6.8	6	1.2	13.6
	Unknown #2							3.2	0.6	2.9	1	0.2	2.3
	TEAX							1.5	0.3	1.3	2	0.4	4.6
	ORHY							1.0	0.2	0.9	1	0.2	2.3
		57.9	11.6	100.0	27	5.4	100.0	111.7	22.2	100.0	44	8.8	100.0

TABLE E-4 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ATCO	1.0	0.2	0.9	1	0.2	1.7						
SS 4/23	GUSA(d)	42.4	8.5	38.4	19	3.8	31.7						
	TEGL	12.2	2.4	11.1	3	0.6	5.0						
	HIJA	2.1	0.4	1.9	4	0.8	6.7	4.6	0.9	3.9	9	1.8	12.2
	CRHY	9.8	2.0	8.9	8	1.6	13.3	11.1	2.2	9.5	11	2.2	14.9
	SIHY	1.0	0.2	0.9	1	0.2	1.7						
	ERMI(s)	23.9	4.8	21.7	11	2.2	18.3	33.2	6.6	28.3	16	3.2	21.6
	Unknown (4/22)	17.9	3.6	16.2	13	2.6	21.7						
	GUMI							34.9	7.1	29.7	18	3.6	24.3
	TEGL							14.3	3.9	12.2	4	0.8	5.4
	ERMI							19.3	4.9	16.4	16	3.2	21.6
		110.3	22.1	100.0	60	12.0	100.1	117.4	25.6	100.0	74	14.8	100.0

TABLE E-5
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 5

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ORHY(s)	19.5	3.9	21.3	15	3.0	41.7	21.0	4.2	27.8	14	2.8	45.1
SS 5/1	CHGR(d)	50.8	10.2	55.5	14	4.7	38.9	46.0	9.2	60.9	12	2.4	38.7
	ATCA	7.5	1.5	8.2	3	0.6	8.3						
	GUSA	8.2	1.6	9.0	2	0.4	5.5	2.0	0.4	2.7	1	0.2	3.2
	SACA	5.5	1.1	6.0	2	0.4	5.5	2.5	0.5	3.3	3	0.6	9.7
	TEGL							4.0	0.8	5.3	1	0.2	3.3
		91.5	18.3	100.0	36	9.1	99.9	75.5	15.1	100.0	31	6.2	100.0
MX 181	ATCA(d)	40.7	8.1	40.6	13	2.6	30.2	44.1	8.8	77.9	12	2.4	57.1
SS 5/2	CELA	5.5	1.1	5.5	3	0.6	7.0						
	ARSP	0.2	0.0	0.2	1	0.2	2.3						
	KOAM(s)	53.8	10.8	53.7	26	5.2	60.5	8.9	1.8	15.7	7	1.4	33.3
	SIHY							2.0	0.4	3.5	1	0.2	4.7
	TEGL							1.6	0.3	2.8	1	0.2	4.8
		100.2	20.0	100.0	43	8.6	100.0	56.6	11.3	99.9	21	4.2	99.9
MX 181	KOAM(s)	36.9	7.4	30.4	15	3.0	26.8	57.0	11.4	46.6	28	5.6	42.4
SS 5/3	ATCO(d)	78.9	15.8	65.0	37	7.4	66.1	51.7	10.3	42.3	24	4.8	36.4
	ORHY	5.6	1.1	4.6	4	0.8	7.1	5.7	1.1	4.7	8	1.6	12.1
	ARSP							3.5	0.7	2.9	2	0.4	3.0
	SIHY							4.3	0.9	3.5	4	0.8	6.1
		121.4	24.3	100.0	56	11.2	100.0	122.2	24.4	100.0	66	13.2	100.0
MX 181	HIJA(d)	62.5	12.5	85.6	129	25.8	92.1	73.2	14.6	89.5	138	27.6	92.6
SS 5/4	ORHY(s)	10.5	2.1	14.3	11	2.2	7.9	6.1	1.2	7.5	10	2.0	6.3
								2.5	0.5	3.0	1	0.2	0.7
		73.0	14.6	99.9	140	28.0	100.0	81.8	16.3	100.0	149	29.8	99.6
MX 181	CELA(d)	168.2	33.6	97.3	101	20.2	96.2	130.9	26.2	96.7	90	18.0	94.7
SS 5/5	ATCA(s)	2.7	0.5	1.6	2	0.4	1.9	4.5	0.9	3.3	5	1.0	5.3
	ORHY	1.8	0.4	1.0	2	0.4	1.9						
		172.7	34.5	99.9	105	21.0	100.0	135.4	27.1	100.0	95	19.0	100.0
MX 181	SPCR(s)	4.2	0.8	26.3	8	1.6	11.6	8.1	1.6	7.0	9	1.8	10.5
SS 5/6	CELA(d)	109.8	22.0	68.8	55	11.0	79.7	67.4	13.5	58.1	44	8.8	51.2
	GUMI	6.8	1.4	4.2	3	0.6	4.4	24.5	4.9	21.1	10	2.0	11.6
	ORHY	0.3	0.1	0.1	1	0.2	1.5	10.0	2.0	8.6	9	1.8	10.5
	HIJA	0.7	0.1	0.4	2	0.4	2.9	2.8	0.6	2.4	10	2.0	11.6
	CHVI							3.3	0.7	2.8	4	0.8	4.7
		121.8	24.4	99.8	69	13.8	100.1	116.1	23.3	100.0	86	17.2	100.1

TABLE E-5 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	TEGL(d)	86.5	17.3	66.4	16	3.2	57.1	1.8	0.4	1.9	1	0.2	3.6
SS 5/7	CHVI	7.0	1.4	5.4	2	0.4	7.1						
	EPNE	8.8	1.8	6.8	3	0.6	10.7	15.4	3.1	16.2	4	0.8	14.3
	LYAN	6.5	1.3	5.0	2	0.4	7.1						
	GRSP	21.5	4.3	16.5	5	1.0	17.9						
	ARTR(s)							67.7	13.5	71.4	18	3.6	64.3
	GUMI							10.0	2.0	10.5	5	1.0	17.9
		130.3	26.1	100.1	28	5.6	100.0	94.9	19.0	100.0	28	5.6	100.1
MX 181	GUMI(d)	89.9	18.0	60.9	36	7.2	72.0	61.3	12.3	51.3	22	4.4	57.8
SS 5/8	EPNE(s)	40.6	8.1	27.5	4	0.8	8.0	18.0	3.6	15.1	1	0.2	2.6
	HIJA	1.7	0.3	1.2	3	0.6	6.0	3.3	0.7	2.8	9	1.8	23.7
	TEGL	5.0	1.0	3.4	2	0.4	4.0	29.0	5.8	24.3	4	0.8	10.5
	SIHY	2.0	0.4	1.4	1	0.2	2.0						
	ORHY	0.5	0.1	0.3	1	0.2	2.0						
	CHVI	8.0	1.6	5.4	3	0.6	6.0	8.0	1.6	6.7	2	0.4	5.3
		147.7	29.5	100.1	50	10.0	100.0	119.6	24.0	100.2	38	7.6	99.9
MX 181	CHVI(d)	67.3	13.5	68.7	20	4.0	46.5	11.1	2.2	10.4	10	2.0	11.2
SS 5/9	CELA(s)	12.4	2.5	12.7	10	2.0	23.3	23.7	4.7	22.2	22	4.4	24.7
	HIJA	8.5	1.7	8.7	11	2.2	25.6	20.2	4.0	19.0	41	8.2	46.0
	GUMI	2.5	0.5	2.6	1	0.2	2.3	11.9	2.4	11.2	7	1.4	7.9
	EPNE	7.3	1.5	7.5	1	0.2	2.3	6.4	1.3	6.0	2	0.4	2.3
	SIHY							1.3	0.3	1.2	1	0.2	1.1
	ORHY							3.2	0.6	3.0	3	0.6	3.4
	TEGL							22.5	4.5	21.1	2	0.4	2.2
	ARTR							6.3	1.3	5.9	1	0.2	1.1
		98.0	19.7	100.2	43	8.6	100.0	106.6	21.3	100.0	89	17.8	99.9
MX 181	HIJA	11.1	2.2	9.7	19	3.8	42.2						
SS 5/10	EPNE	19.6	3.9	17.3	7	1.4	15.6						
	CHVI	24.5	4.9	21.6	6	1.2	13.3						
	GUMI	6.4	1.3	5.6	4	0.8	8.9	20.6	4.1	24.7	9	1.8	42.9
	TEGL(d)	51.5	10.3	45.4	8	1.6	17.8	6.3	1.3	7.6	2	0.4	9.5
	CELA	0.4	0.1	0.4	1	0.2	2.2						
	CHNA							3.5	0.7	4.2	1	0.2	4.8
	PEPA							2.0	0.4	2.4	1	0.2	4.8
	ATCA(s)							28.8	5.8	34.5	4	0.8	19.0
	VIMU							2.4	0.5	2.9	2	0.4	9.5
	COME							10.0	2.0	12.0	1	0.2	4.8
	LYAN							9.8	2.0	11.8	1	0.2	4.8
		113.5	22.7	100.0	45	9.0	100.0	83.4	16.8	100.1	21	4.2	100.1

TABLE E-5 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	SPCR	1.3	0.3	1.1	1	0.2	2.6						
SS 5/11	HIJA	12.5	2.5	10.9	22	4.4	56.4	6.9	1.4	7.0	14	2.8	37.8
	EPNE(s)	21.8	4.4	19.0	2	0.4	5.1	1.5	0.3	1.5	1	0.2	2.7
	LYAN	19.0	3.8	16.6	3	0.6	7.7						
	TEGL	22.5	4.5	19.6	4	0.8	10.3						
	GUMI	6.0	1.2	5.2	1	0.2	2.6						
	CHVI	1.5	0.3	1.3	1	0.2	2.6						
	ARTR(d)	30.0	6.0	26.2	5	1.0	12.8	64.2	12.8	65.1	15	3.0	40.5
	VIMU							6.6	1.3	6.7	4	0.8	10.8
	COME							18.0	3.6	18.2	2	0.4	5.4
	OPEC							1.5	0.3	1.5	1	0.2	2.7
		114.6	23.0	99.9	39	7.8	100.1	98.7	19.7	100.0	37	7.4	99.9
MX 181	HIJA(d)	15.4	3.1	24.8	70	14.0	84.3	26.1	5.2	55.7	71	14.2	83.5
SS 5/12	EPNE(s)	13.6	2.7	21.6	3	0.6	3.6	11.5	2.3	24.5	1	0.2	1.2
	ORHY	2.5	0.5	4.0	1	0.2	1.2						
	SPCR	9.1	1.8	14.4	4	0.8	4.8	6.3	1.3	13.4	11	2.2	12.9
	ARTR	18.3	3.7	29.6	2	0.4	2.4						
	GUMI	3.5	0.7	5.6	1	0.2	1.2						
	VIMU	0.2	0.0	0.0	1	0.2	1.2						
	LYAN	0.2	0.0	0.0	1	0.2	1.2	2.8	0.6	6.0	1	0.2	1.2
	ARPU							0.2	0.0	0.4	1	0.2	1.2
		62.8	12.5	100.0	83	16.6	99.9	46.9	9.4	100.0	85	17.0	100.0
MX 181	HIJA(d)	20.3	4.1	69.5	47	9.4	83.9						
SS 5/13	SPCR(s)	3.4	0.7	11.9	2	0.4	3.6	4.9	1.0	100.0	6	1.2	100.0
	ORHY	4.8	1.0	16.9	5	1.0	8.9						
	CELA	0.4	0.1	1.7	2	0.4	3.6						
		28.9	5.9	100.0	56	11.2	100.0	4.9	1.0	100.0	6	1.2	100.0
MX 181	EPNE(s)	22.5	4.5	25.6	2	0.4	3.3						
SS 5/14	HIJA(d)	44.1	8.8	50.0	47	9.4	77.1	26.8	6.5	57.5	41	8.2	74.5
	ORHY	10.9	2.2	12.5	5	1.0	8.2						
	SIHY	3.2	0.6	3.4	2	0.4	3.3						
	CHVI	4.3	0.9	5.1	2	0.4	3.3						
	CELA	0.8	0.2	1.1	1	0.2	1.6	1.0	0.2	1.8	1	0.2	1.8
	SPCR	1.9	0.4	2.3	2	0.4	3.3	11.1	2.2	19.5	8	1.6	14.5
	GUMI							12.1	2.4	21.2	5	1.0	9.1
		87.7	17.6	100.0	61	12.2	100.1	51.0	11.3	100.0	55	11.0	99.9

TABLE E-5 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	HIJA	40.4	8.1	42.5	43	8.6	58.9						
SS 5/15	SPCR	31.1	6.2	32.7	25	5.0	34.3						
	OPEC	1.5	0.3	1.6	1	0.2	1.4						
	EPNE(d)	22.0	4.4	23.2	4	0.8	5.5	48.0	9.6	47.3	5	1.0	33.3
	FAPA(s)							47.0	9.4	46.3	8	1.6	53.3
	GUMI							6.5	1.3	6.4	2	0.4	13.3
		95.0	19.0	100.0	73	14.6	100.1	101.5	20.3	100.0	15	3.0	99.9
MX 181	CELA(s)	13.4	2.7	12.8	14	2.8	15.2	52.7	10.5	77.5	44	8.8	73.3
SS 5/16	HIJA(d)	80.5	16.1	76.7	73	14.6	79.4	8.0	1.6	11.8	12	2.4	20.0
	CHVI	10.0	2.0	9.5	4	0.8	4.4						
	CRHY	1.1	0.2	1.1	1	0.2	1.1	7.3	1.5	10.7	4	0.8	6.7
		105.0	21.0	100.1	92	18.4	100.1	68.0	13.6	100.0	60	12.0	100.0
MX 181	HIJA	6.3	1.3	5.5	9	1.8	23.7	6.1	1.2	6.7	8	1.6	10.5
SS 5/17	ARTR(d)	75.1	15.0	65.0	17	3.4	44.7						
	CHVI	1.7	0.3	1.5	2	0.4	5.3	3.0	0.6	3.3	1	0.2	1.3
	TEGL	12.3	2.5	10.6	3	0.6	7.9						
	GUMI	2.0	0.4	1.7	1	0.2	2.6	5.9	1.2	6.7	3	0.6	4.0
	EPNE	15.1	3.0	13.1	4	0.8	10.5						
	CRHY	1.2	0.2	1.0	1	0.2	2.6	1.7	0.3	1.7	2	0.4	2.6
	ARPU	1.9	0.4	1.6	1	0.2	2.6						
	CELA(s)							71.1	14.2	78.9	57	11.4	75.0
	SPCR							1.2	0.2	1.1	3	0.6	4.0
	LYAN							1.0	0.2	1.1	1	0.2	1.3
	SIHY							0.6	0.1	0.6	1	0.2	1.3
		115.6	23.1	100.0	38	7.6	99.9	90.6	18.0	100.1	76	15.2	100.0
MX 181	SPCR	15.2	3.0	23.9	21	4.2	25.0	2.8	0.6	2.3	8	1.6	9.9
SS 5/18	HIJA(s)	25.8	5.2	40.6	41	8.2	48.8	11.0	2.2	9.0	21	4.2	25.9
	CELA	17.1	3.4	26.9	17	3.4	20.2	10.6	2.1	8.7	10	2.0	12.3
	CRHY	5.1	1.0	8.0	4	0.8	4.8	1.8	0.4	1.5	3	0.6	3.7
	SPGR	0.4	0.1	0.6	1	0.2	1.2	0.5	0.1	0.4	1	0.2	1.2
	GUMI(d)							82.8	16.6	67.6	33	6.6	40.7
	ARPU							5.5	1.1	4.5	2	0.3	2.5
	CHVI							6.5	1.3	5.3	2	0.4	2.5
	SIHY							1.0	0.2	0.8	1	0.2	1.2
		63.6	12.7	100.0	84	16.8	100.0	122.5	24.6	100.1	81	16.1	99.9

TABLE E-5 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181 SS 5/19	HIJA(d)	37.8	7.6	38.3	51	10.2	53.1						
	SPCR	7.1	1.4	7.2	14	2.8	14.6						
	CELA(s)	26.3	5.3	26.7	19	3.8	19.8						
	EPNE	14.8	3.0	15.0	3	0.6	3.1						
	SIHY	4.4	0.9	4.5	3	0.6	3.1						
	ARPU	3.0	0.6	3.0	2	0.4	2.1						
	CHVI	3.6	0.7	3.7	2	0.4	2.1						
	SPAM	1.6	0.3	1.6	2	0.4	2.1						
	GUMI							2.6	0.5	25.7	2	0.4	33.3
	VIMU							4.9	1.0	48.5	4	0.6	50.0
	ORHY							2.6	0.5	25.7	1	0.2	16.6
		98.6	19.8	100.0	96	19.2	100.0	10.1	2.0	99.9	7	1.2	99.9
MX 181 SS 5/20	ARTR(d)	84.9	17.0	64.4	22	4.4	62.9						
	EPNE	27.8	5.6	21.2	7	1.4	20.0	5.0	1.0	6.2	1	0.2	3.3
	HIJA	0.3	0.1	0.4	1	0.2	2.9	2.4	0.5	3.0	4	0.8	13.3
	ORHY	1.5	0.3	1.1	1	0.2	2.9	2.0	0.4	2.5	1	0.2	3.3
	TEGL	10.1	2.0	7.6	2	0.4	5.7						
	CHVI	6.9	1.4	5.3	2	0.4	5.7	14.8	3.0	18.5	6	1.2	20.0
	ARNO(s)							52.0	10.4	64.8	15	3.0	50.0
	ARPU							0.5	0.1	0.6	2	0.4	6.7
	LYAN							3.5	0.7	4.4	1	0.2	3.3
		131.5	26.4	100.0	35	7.0	100.1	80.2	16.1	100.0	30	6.0	99.9
MX 181 SS 5/21	ARNO(d)	108.8	21.8	91.2	28	5.6	70.0	123.5	24.7	82.2	27	5.4	77.1
	HIJA	7.5	1.5	6.3	10	2.0	25.0	0.8	0.2	0.5	2	0.4	5.7
	ARPU	0.5	0.1	0.4	1	0.2	2.5						
	ORHY	2.5	0.5	2.1	1	0.2	2.5	1.5	0.3	1.0	1	0.2	2.9
	SIHY							1.5	0.3	1.0	1	0.2	2.9
	TEGL(s)							17.0	3.4	11.3	3	0.6	8.6
	EPNE							6.0	1.2	4.0	1	0.2	2.9
		119.3	23.9	100.0	40	8.0	100.0	150.3	30.1	100.0	35	7.0	100.1
MX 181 SS 5/22	ARNO(d)	113.9	22.8	91.9	27	5.4	84.4	30.5	6.1	21.9	6	1.2	21.4
	EPNE	8.5	1.7	6.9	2	0.4	6.3						
	SIHY	0.6	0.1	0.5	1	0.2	3.1	0.5	0.1	0.4	1	0.2	3.6
	HIJA	0.9	0.2	0.7	2	0.4	6.3						
	GUMI							30.6	6.1	21.9	11	2.2	39.3
	LYAN							7.3	1.5	5.2	1	0.2	3.6
	TEGL							8.2	1.6	5.9	1	0.2	3.6
	PRPA(s)							59.4	11.9	42.6	7	1.4	25.0
	ATCA							3.0	0.6	2.2	1	0.2	3.6
		123.9	24.8	100.0	32	6.4	100.1	139.5	27.9	100.1	28	5.6	100.1

TABLE E-5 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Dens. (%)
MX 181	ARTR(d)	126.7	25.3	88.5	35	7.0	81.4	119.7	23.9	92.6	28	5.6	84.9
SS 5/23	CHVI(s)	9.5	1.9	6.6	4	0.8	9.3	1.2	0.2	0.8	1	0.2	3.0
	ORHY	0.1	0.0	0.1	1	0.2	2.3	1.3	0.3	1.2	1	0.2	3.0
	SIHY	1.0	0.2	0.7	1	0.2	2.3	3.1	0.6	2.3	2	0.4	6.1
	EPNE	5.0	1.0	3.5	1	0.2	2.3	4.0	0.8	3.1	1	0.2	3.0
	ARPU	0.8	0.2	0.8	1	0.2	2.3						
		143.1	28.6	100.2	43	8.6	99.9	129.3	25.8	100.0	33	6.6	100.0

TABLE E-6
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 6

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 6/1	AMER (d)							87.4	17.5	63.2	14	2.8	48.3
	ARTR	5.0	1.0	7.3	1	0.2	4.4	24.7	4.9	17.9	8	1.6	27.6
	CHVI (s)	33.6	6.7	48.8	11	2.2	47.8						
	EPNE	2.5	0.5	3.6	2	0.4	8.7	6.4	1.3	4.6	1	0.2	3.5
	GRSP	6.0	1.2	8.7	2	0.4	8.7						
	GUMI	1.0	0.2	1.5	1	0.2	4.4	14.1	2.8	10.2	5	1.0	17.2
	LYAN	0.3	0.1	0.4	1	0.2	4.4	5.8	1.2	4.2	1	0.2	3.5
	TEGL	19.5	3.9	28.3	4	0.8	17.4						
	SIHY	1.0	0.2	1.5	1	0.2	4.4						
		68.9	13.8	100.1	23	4.6	100.2	138.4	27.7	100.1	29	5.8	100.1
MX 181 SS 6/2	ARSP	14.8	3.0	14.7	5	1.0	12.5						
	CELA	1.8	0.4	1.8	1	0.2	2.5						
	CHVI	22.5	4.5	22.3	8	1.6	20.0	7.0	1.4	4.7	1	0.2	2.6
	EPNV	3.0	0.6	3.0	1	0.2	2.5	17.2	3.4	11.5	3	0.6	7.9
	GRSP (s)	29.4	5.9	29.1	6	1.2	15.0	26.3	5.3	17.5	6	1.2	15.8
	GUMI	6.0	1.2	5.9	4	0.8	10.0	12.7	2.5	8.5	5	1.0	13.2
	LYAN	6.8	1.4	6.7	2	0.4	5.0	1.0	0.2	0.7	1	0.2	2.6
	TEGL (d)	10.6	2.1	10.5	2	0.4	5.0	58.4	11.7	38.9	10	2.0	26.3
	HIJA	5.7	1.1	5.6	10	2.0	25.0	2.0	0.4	1.3	5	1.0	13.2
	AMER	0.4	0.1	0.4	1	0.2	2.5						
	TEAX							19.0	3.8	12.7	3	0.6	7.9
	MUPO							5.3	1.1	3.5	3	0.6	7.9
	SIHY							1.3	0.3	0.9	1	0.2	2.6
		101.0	20.3	100.0	40	8.0	100.0	150.2	30.1	100.2	38	7.6	100.0
MX 181 SS 6/3	ARTR							7.0	1.4	5.6	1	0.2	4.2
	ATCA							6.3	1.3	5.0	1	0.2	4.2
	CELA	0.5	0.1	0.4	1	0.2	2.9	3.9	0.7	3.1	2	0.4	8.3
	CHVI (d)	79.6	15.9	67.3	25	5.0	73.5	20.6	4.1	16.4	6	1.2	25.0
	EPNV	5.0	1.0	4.2	1	0.2	2.9	19.3	3.9	15.3	2	0.4	8.3
	GRSP (s)	3.2	0.6	2.7	1	0.2	2.9	24.5	4.9	19.5	4	0.8	16.7
	LYAN	1.0	0.2	0.9	1	0.2	2.9	18.2	3.6	14.5	3	0.6	12.5
	TEGL	29.0	5.8	24.5	5	1.0	14.7						
	GUMI							21.1	4.2	16.8	3	0.6	12.5
	SPCO							2.3	0.5	1.8	1	0.2	4.2
	AMER							2.7	0.5	2.1	1	0.2	4.2
		118.3	23.6	100.0	34	6.8	99.8	125.9	25.1	100.1	24	5.0	100.1

TABLE E-6 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CELA (s)	17.3	3.5	10.8	8	1.6	17.8	32.5	6.5	18.6	13	2.6	15.5
SS 6/4	CHGR	36.1	7.2	22.5	10	2.0	22.2						
	GRSP (d)	56.5	11.3	35.4	11	2.2	24.4	41.7	8.3	23.8	8	1.6	9.5
	LYAN	20.3	4.1	12.7	5	1.0	11.1	18.5	3.7	10.6	5	1.0	6.0
	TEGL	25.5	5.1	16.0	4	0.8	8.9	21.5	4.3	12.3	2	0.4	2.4
	HIJA (d)	4.1	0.8	2.6	7	1.4	15.6	60.3	12.1	34.7	56	11.2	66.7
		159.8	32.0	100.0	45	9.0	100.0	174.5	34.9	100.0	84	16.8	100.1
MX 181	ARSP	8.0	1.6	11.2	4	0.8	11.8	6.9	1.4	6.8	4	0.8	5.6
SS 6/5	CHVI	2.5	0.5	3.5	1	0.2	2.9	4.7	0.9	4.6	2	0.4	2.8
	EPNE (s)	16.0	3.2	22.5	4	0.8	11.8	18.7	3.7	18.3	4	0.8	5.6
	GRSP (d)	21.0	4.2	29.5	5	1.0	14.7	36.5	7.3	35.8	7	1.4	9.7
	LYAN	4.0	0.8	5.6	1	0.2	2.9	5.0	1.0	4.9	1	0.2	1.4
	TEGL	13.9	2.8	19.5	4	0.8	11.8						
	HIJA	4.8	1.0	6.7	14	2.8	41.2	26.1	5.2	25.6	51	10.2	70.8
	ORHY	1.0	0.2	1.4	1	0.2	2.9	2.4	0.5	2.4	1	0.2	1.4
	ASIE							1.8	0.4	1.8	2	0.4	2.8
		71.2	14.3	99.9	34	6.8	100.0	102.1	20.4	100.2	72	14.4	100.1
MX 181	ARTR	7.0	1.4	9.6	2	0.4	8.7						
SS 6/6	CHVI (s)	29.0	5.8	39.9	8	1.6	34.8	2.1	0.4	1.7	1	0.2	2.7
	EPNE (s)	14.3	2.9	19.7	3	0.6	13.0	16.8	3.4	13.4	5	1.0	13.5
	LYAN	3.0	0.6	4.1	3	0.6	13.0	14.5	2.9	11.5	3	0.6	8.1
	GRSP (d)	6.4	1.3	8.8	2	0.4	8.7	82.6	16.5	65.7	16	3.2	43.2
	HYSA	11.9	2.4	16.4	4	0.8	17.4						
	ORHY	10.0	0.2	1.4	1	0.2	4.4	1.0	0.2	0.8	1	0.2	2.7
	SIHY							0.6	0.1	0.5	1	0.2	2.7
	ASLE							0.2	0.0	0.2	1	0.2	2.7
	HIJA							2.3	0.5	1.8	7	1.4	18.9
	TEGL							5.5	1.1	4.4	1	0.2	2.7
	ERPU							0.2	0.0	0.2	1	0.2	2.7
		71.6	14.6	99.9	23	4.6	100.0	125.8	25.1	100.2	37	7.4	99.9

TABLE E-6 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Transect 2 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 6/7	ARTR (s)	7.0	1.4	6.1	1	0.2	4.0	64.2	12.8	39.2	7	1.4	20.0
	ATCA	2.0	0.4	1.7	1	0.2	4.0	0.7	0.1	0.4	1	0.2	2.9
	CHVI	17.5	3.5	15.2	4	0.8	16.0	34.9	7.0	21.3	10	2.0	28.6
	EPNE (d)	58.8	11.8	51.0	9	1.8	36.0	22.1	4.4	13.5	6	1.2	17.2
	GRSP	13.0	2.6	11.3	4	0.8	16.0	7.7	1.5	4.0	2	0.4	5.7
	LYAN	4.0	0.8	3.5	2	0.4	8.0	17.6	3.5	10.7	5	1.0	14.3
	TEGL	10.0	2.0	8.7	3	0.6	12.0	11.7	2.3	7.1	2	0.4	5.7
	MUPO	3.0	0.6	2.6	1	0.2	4.0						
	ARSP							0.9	0.2	0.6	1	0.2	2.9
	YUBA							4.0	0.8	2.4	1	0.2	2.9
		115.3	23.1	100.1	25	5.0	100.0	163.8	32.6	99.8	35	7.0	100.2
MX 181 SS 6/8	ARSP							0.8	0.2	0.7	1	0.2	1.8
	ATCA	4.5	0.9	4.6	4	0.8	10.3						
	CELA	9.9	2.0	10.0	6	1.2	15.4	11.5	2.3	10.0	10	2.0	17.9
	CHGR (d)	59.4	11.9	60.1	22	4.4	56.4	77.8	15.6	67.8	21	4.2	37.5
	GRSP (s)	24.5	4.9	24.8	6	1.2	15.4	9.1	1.8	7.9	3	0.6	5.4
	ORHY	0.5	0.1	0.5	1	0.2	2.6	1.7	0.3	1.5	1	0.2	1.8
	HIJA							10.0	2.0	8.7	18	3.6	32.1
	TEGL							3.9	0.8	3.4	2	0.4	3.6
		98.8	19.8	100.0	39	7.8	100.1	114.8	23.0	100.0	56	11.2	100.1
MX 181 SS 6/9	ARSP	3.0	0.6	3.5	2	0.4	3.5	1.1	0.2	1.9	1	0.2	1.5
	ATCA							3.5	0.7	6.1	1	0.2	1.5
	CHVI	3.0	0.6	3.5	1	0.2	1.8	3.4	0.7	5.9	3	0.6	4.4
	EPNE (d)	34.8	7.0	40.5	7	1.4	12.3	14.0	2.8	24.3	6	1.2	8.7
	GRSP (s)	12.5	2.5	14.5	2	0.4	3.5	5.2	1.0	9.0	1	0.2	1.5
	LYAN	4.0	0.8	4.7	1	0.2	1.8						
	HIJA (d)	28.2	5.6	32.8	43	8.6	75.4	19.2	3.8	33.3	53	10.6	76.8
	ORHY	0.5	0.1	0.6	1	0.2	1.8	2.6	0.5	4.5	2	0.4	2.9
	SIHY							0.7	0.1	1.2	1	0.2	1.5
	TEGL							8.0	1.6	13.9	1	0.2	1.5
		86.0	17.2	100.1	57	11.4	100.1	57.7	11.4	100.1	69	13.8	100.3

TABLE E-6 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Transect 2 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARSP	5.3	1.1	9.0	2	0.4	4.1	2.1	0.4	2.3	2	0.4	4.2
SS 6/10	EPNE	5.3	1.1	9.0	2	0.4	4.1	8.3	1.7	9.1	2	0.4	4.2
	GRSP	7.0	1.4	11.8	2	0.4	4.1	5.2	1.0	5.7	1	0.2	2.1
	LYAN (s)	15.0	3.0	25.3	3	0.6	6.1	16.6	3.3	18.2	4	0.8	8.3
	TEAX	4.0	0.8	6.8	1	0.2	2.0						
	TEGL (d)	8.5	1.7	14.4	1	0.2	2.0	40.8	8.2	44.7	6	1.2	12.5
	HIJA	13.6	2.7	23.0	37	7.4	75.5	14.8	3.0	16.2	32	6.4	66.6
	SIHY	0.5	0.1	0.8	1	0.2	2.0	3.5	0.7	3.8	1	0.2	2.1
		59.2	11.9	100.1	49	9.8	99.9	91.3	18.3	100.0	48	9.6	100.0
MX 181		16.4	3.3	18.5	11	2.2	13.8	19.7	3.9	24.9	18	3.6	24.0
SS 6/11	ATCA	2.3	0.5	2.6	1	0.2	1.3						
	CELA	10.7	2.1	12.1	19	3.8	23.8	8.3	1.7	10.5	9	1.8	12.0
	EPNE	0.3	0.1	0.3	2	0.4	2.5	22.6	4.5	28.6	8	1.6	10.7
	GUSA (d)	48.6	9.7	54.9	20	4.0	25.0	9.8	2.0	12.4	2	0.4	2.7
	HIJA	10.2	2.0	11.5	27	5.4	33.8	17.9	3.6	22.6	36	7.2	48.0
								0.8	0.2	1.0	2	0.4	2.7
		88.5	17.7	99.9	80	16.0	100.2	79.1	15.9	100.0	75	15.0	100.1
MX 181	ARSP	3.2	0.6	2.2	3	0.6	5.2	0.5	0.1	0.4	1	0.2	2.7
SS 6/12	ATCA	3.2	0.6	2.2	2	0.4	3.5	1.5	0.3	1.2	1	0.2	2.7
	CELA	4.7	0.9	3.2	3	0.6	5.2	1.5	0.3	1.2	1	0.2	2.7
	CHGR (s)	47.4	9.5	32.5	15	3.0	25.9	28.5	5.7	23.4	8	1.6	21.6
	EPNE	21.7	4.3	14.9	6	1.2	10.3	32.2	6.4	26.5	8	1.6	21.6
	GRSP	36.9	7.4	25.3	8	1.6	13.8	2.4	0.5	2.0	1	0.2	2.7
	LYAN	4.1	0.8	2.8	1	0.2	1.7	0.4	0.1	0.3	1	0.2	2.7
	TEGL (d)	15.6	3.1	10.7	3	0.6	5.2	48.8	9.8	40.1	9	1.8	24.3
	HIJA	3.7	0.7	2.5	13	2.6	22.4	[illegible]	0.7	3.0	5	1.0	13.5
	ORHY	2.5	0.5	1.7	1	0.2	1.7	2.2	0.4	1.8	2	0.4	5.4
	SIHY	2.7	0.5	1.9	3	0.6	5.2						
		145.7	28.9	99.9	58	11.6	100.1	121.6	24.3	99.9	37	7.4	99.9
MX 181	ATCO (d)	47.5	9.5	63.1	33	6.6	54.1	62.5	12.5	72.2	33	6.6	62.2
SS 6/13	KOAM (s)	26.3	5.3	34.9	26	5.2	42.6	20.7	4.1	23.9	17	3.4	32.0
	ORHY	1.5	0.3	2.0	2	0.4	3.3	1.2	0.2	1.4	2	0.4	3.7
	ARSP							2.2	0.4	2.5	1	0.2	[illegible]
		75.3	15.1	100.0	61	12.2	100.0	86.6	17.2	100.0	53	10.6	[illegible]

TABLE E-6 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARSP							2.3	0.5	1.9	1	0.2	2.5
SS 6/14	ATCA							1.0	0.2	0.8	1	0.2	2.5
	CHGR (s)	38.5	7.7	28.8	9	1.8	17.0	15.1	3.0	12.3	6	1.2	15.0
	EPNE (d)	47.1	9.4	35.2	9	1.8	17.0	49.8	10.0	40.7	11	2.2	27.5
	GRSP	6.9	1.4	5.2	3	0.6	5.7	14.5	2.9	11.8	6	1.2	15.0
	LYAN	11.2	2.2	8.4	4	0.8	7.5	27.[illegible]	5.6	22.7	6	1.2	15.0
	TEAX							2.0	0.4	1.6	1	0.2	2.5
	HLJA	19.2	3.8	14.4	24	4.8	45.3	5.5	1.1	4.5	6	1.2	15.0
	ORHY	4.9	1.0	3.7	2	0.4	3.8	4.4	0.9	3.6	2	0.4	5.0
	TEGL	6.0	1.2	4.5	2	0.4	3.8						
		133.8	26.7	100.2	53	10.6	100.1	122.5	24.6	99.9	40	8.0	100.0
MX 181	ARSP	5.2	1.0	3.1	4	0.8	6.3	2.8	0.6	2.1	1	0.2	1.8
SS 6/15	ATCA	0.5	0.1	0.3	1	0.2	1.6						
	CHGR	8.3	1.7	5.0	2	0.4	3.1						
	EPNE (d)	94.6	18.9	57.1	9	1.8	14.1	32.4	6.5	24.3	8	1.6	14.3
	GRSP (s)	16.7	3.3	10.1	5	1.0	7.8	51.6	10.3	38.7	12	2.4	21.4
	LYAN	3.5	0.7	2.1	1	0.2	1.6	17.8	3.5	13.3	6	1.2	10.7
	HLJA	34.5	6.9	20.8	40	8.0	62.5	25.5	5.1	19.1	27	5.4	48.2
	SIHY	2.4	0.4	1.5	2	0.4	3.1						
	CHOLLA							3.4	0.7	2.6	2	0.4	3.6
		165.7	33.0	100.0	64	12.8	100.1	133.5	26.7	100.1	56	11.2	100.0
MX 181	CHVI	6.7	1.3	4.2	2	0.4	6.3	4.0	0.8	3.5	1	0.2	3.4
SS 6/16	EPNE (s)	50.1	10.0	31.7	6	1.2	18.8	7.6	1.5	6.7	2	0.4	6.9
	GRSP (d)	33.7	6.7	21.3	10	2.0	31.3	70.3	14.1	61.8	14	2.8	48.3
	HYSA	25.6	5.1	16.2	9	1.8	28.1	21.9	4.4	19.3	6	1.2	20.7
	LYAN	39.6	7.9	25.1	4	0.8	12.5						
	ORHY	2.3	0.4	1.5	1	0.2	3.1	2.1	0.4	1.9	1	0.2	3.4
	ATCA							2.0	0.4	1.8	1	0.2	3.4
	SIHY							2.5	0.5	2.2	1	0.2	3.4
	ARSP							3.3	0.7	2.9	3	0.6	10.3
		158.0	31.4	100.0	32	6.4	100.1	113.7	22.8	100.1	29	5.8	99.8
MX 181	ARTR (d)	122.7	24.5	82.4	21	4.2	80.8	26.7	5.3	27.6	5	1.0	20.0
SS 6/17	CHVI (s)	1.9	0.4	1.3	1	0.2	3.9	44.5	8.9	46.0	15	3.0	60.0
	EPNE	24.3	4.9	16.3	4	0.8	15.4	18.6	3.7	19.2	4	0.8	16.0
	GRSP							7.0	1.4	7.2	1	0.2	4.0
		148.9	29.8	100.0	26	5.2	100.1	96.8	19.3	100.0	25	5.0	100.0

TABLE E-6 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARSP	2.2	0.4	1.6	1	0.2	2.3	6.7	1.3	5.6	3	0.6	7.1
SS 6/18	ATCA	1.5	0.3	1.1	1	0.2	2.3	7.3	1.5	6.2	2	0.4	4.8
	CHVI	15.6	3.1	11.5	5	1.0	11.6	31.0	6.2	26.1	8	1.6	19.1
	EPNE (d)	46.6	9.3	34.4	11	2.2	25.6	26.9	5.4	22.7	6	1.2	14.2
	GRSP	10.2	2.0	7.5	2	0.4	4.7	7.5	1.5	6.3	3	0.6	7.1
	TEGL (s)	48.9	9.8	36.1	9	1.8	20.9	12.4	2.5	10.5	4	0.8	9.5
	LYAN							11.2	2.2	9.4	4	0.8	9.5
	HIJA	6.3	1.3	4.6	11	2.2	25.6	9.3	1.9	7.8	8	1[illegible]	19.1
	ORHY	3.0	0.6	2.2	2	0.4	4.7						
	SIHY	1.3	0.3	1.0	1	0.2	2.3	6.4	1.3	5.4	4	0.8	9.5
		135.6	27.1	100.0	43	8.6	100.0	118.7	23.7	100.0	42	8.4	99.9
MX 181	ARSP	5.5	1.1	3.9	2	0.4	8.0						
SS 6/19	ARTR	60.6	12.1	42.7	9	1.8	36.0	97.1	19.4	76.3	14	2.8	70.0
	EPNE	16.5	3.3	11.6	5	1.0	20.0	2[illegible].7	4.5	17.8	4	0.8	20.0
	CHVI	32.1	6.4	22.6	5	1.0	20.0						
	GRSP	7.4	1.5	5.2	1	0.2	4.0	7.5	1.5	5.9	2	0.4	10.0
	LYAN	8.9	1.8	6.3	2	0.4	8.0						
	TEGL	10.9	2.2	7.7	1	0.2	4.0						
		141.9	28.4	100.0	25	5.0	100.0	127.3	25.4	100.0	20	4.0	100.0
MX 181	SIHY							3.6	0.7	1.9	3	0.6	5.2
SS 6/20	ATCA	3.0	0.6	2.4	1	0.2	2.3	1.5	0.3	0.8	1	0.2	1.7
	CHVI (d)	36.0	7.2	28.3	8	1.6	18.6	125.9	25.2	65.0	17	3.4	29.3
	EPNE	32.8	6.6	25.8	4	0.8	9.3	0.4	0.1	0.2	1	0.2	1.7
	GRSP	9.5	1.9	7.5	3	0.6	7.0	31.5	6.3	16.3	8	1.6	13.8
	LYAN	9.2	1.8	7.2	2	0.4	4.7	0.5	0.1	0.3	1	0.2	1.7
	TEGL (s)	22.8	4.6	17.9	5	1.0	11.6	20.8	4.2	10.7	5	1.0	8.6
	HIJA	13.9	2.8	10.9	20	4.0	46.5	9.5	1.9	4.9	22	4.4	37.9
		127.2	25.5	100.0	43	8.6	100.0	193.7	38.8	100.1	58	11.6	99.9
MX 181	ARSP	4.5	0.9	3.5	6	1.2	7.8	20.7	4.1	14.2	11	2.2	16.7
SS 6/21	ATCO (d)							96.2	19.2	66.2	40	8.0	60.6
	ATCA	27.5	5.5	21.3	12	2.4	15.6						
	SU	0.3	0.1	0.2	1	0.5	1.3	13.1	2.6	9.0	8	1.6	12.1
	GRSP (s)	54.6	10.9	42.3	11	2.2	14.3	5.2	1.0	3.6	1	0.2	1.5
	ORHY	8.3	1.7	6.4	3	0.6	3.9						
	CELA	8.4	1.7	6.5	4	0.8	5.2	3.9	0.8	2.7	3	0.6	4.5
	SIHY	6.3	1.3	4.9	3	0.6	3.9	1.2	0.2	0.8	1	0.2	1.5
	SPCR	1.0	0.2	0.8	1	0.5	1.3						
	HIJA	18.2	3.6	14.1	36	7.2	46.8	5.0	1.0	3.4	2	0.4	3.0
		129.1	25.9	100.0	77	16.0	100.1	145.3	28.9	99.9	66	13.2	99.9

TABLE E-6 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARSP (s)	15.3	3.1	9.0	9	1.8	13.2	30.7	6.1	18.4	12	2.4	19.7
SS 6/22	ATCO (d)	139.6	27.9	82.3	49	9.8	72.1	135.1	27.0	81.4	48	9.6	78.7
	CELA	13.4	2.7	7.9	8	1.6	11.8	1.4	0.3	0.2	1	0.2	1.6
	ORHY	1.4	0.3	0.8	2	0.4	2.9						
		169.7	34.0	100.0	68	13.6	100.0	167.2	33.4	100.0	61	12.2	100.0
MX 181	ATCA	18.3	3.7	14.6	3	0.6	5.9						
SS 6/23	CELA	12.3	2.5	9.8	8	1.6	15.7	9.7	1.9	11.8	5	1.0	4.5
	CHVI	17.5	3.5	13.9	6	1.2	11.8	4.0	0.8	4.8	2	0.4	1.8
	GRSP (d)	56.5	11.3	45.0	11	2.2	21.6	14.0	2.8	17.0	2	0.4	1.8
	TEGL	3.0	0.6	2.4	1	0.2	2.0						
	HIJA (s)	11.5	2.3	9.2	19	3.8	37.3	52.3	10.5	63.4	100	20.0	89.3
	ARSP							0.8	0.2	1.0	2	0.4	1.8
	SIHY							1.7	0.3	2.1	1	0.2	0.9
	ORHY	6.5	1.3	5.2	3	0.6	5.9						
		125.6	25.2	100.1	51	10.2	100.2	82.5	16.5	100.1	112	22.4	100.1

TABLE E-7
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 7

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Density (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Densit (%)
MX 181 SS 7/1	CELA (s)	14.0	2.8	14.0	6	1.2	14.0	32.0	6.4	28.9	16	3.2	25.8
	CHVI (d)	61.1	12.2	61.0	13	2.6	30.2	40.6	8.1	36.6	11	2.2	17.7
	ATCA	1.2	0.2	1.2	1	0.2	2.3	8.1	1.6	7.3	5	1.0	8.1
	ORHY	6.7	1.3	6.7	4	0.8	9.3	13.4	2.7	12.1	10	2.0	16.1
	KOAM	7.3	1.5	7.3	7	1.4	16.3	2.1	0.4	1.9	1	0.2	1.6
	ATCO	4.6	0.9	4.6	6	1.2	14.0						
	HIJA	5.3	1.1	5.3	6	1.2	14.0	12.2	2.4	11.0	15	3.0	24.2
	SP							2.4	0.5	2.2	4	0.8	6.5
		100.2	20.0	100.1	43	8.6	100.1	110.8	22.1	100.0	62	12.4	100.0
MX 181 SS 7/2	CHVI (d)	13.9	2.8	31.2	5	1.0	18.5	90.1	18.0	77.1	28	5.6	66.7
	ATCO (s)	17.9	3.6	40.2	7	1.4	25.9	8.3	1.7	7.1	2	0.4	4.8
	STPI	2.6	0.5	5.8	2	0.4	7.4	0.6	0.1	0.5	1	0.2	2.4
	HIJA	3.1	0.6	7.0	6	1.2	22.2	0.6	0.1	0.5	2	0.4	4.8
	ORHY	7.0	1.4	15.7	7	1.4	25.9	6.0	1.2	5.1	5	1.0	11.9
	ATCA							11.3	2.3	9.7	4	0.8	9.5
		44.5	8.9	99.9	27	5.4	99.9	116.9	23.4	100.0	42	8.4	100.1
MX 181 SS 7/3	CHVI (d)	39.7	7.9	30.3	11	2.2	15.3	33.2	6.6	31.0	8	1.6	14.0
	HIJA (s)	25.4	5.1	19.4	47	9.4	65.3	30.6	6.1	28.5	35	7.0	61.4
	TEGL	34.6	6.9	26.4	5	1.	6.9	16.0	3.2	14.9	2	0.4	3.5
	EPNE	22.7	4.5	17.3	4	0.8	5.6	14.5	2.9	13.5	5	1.0	8.8
	ORHY	1.9	0.8	1.5	3	0.6	4.2						
	LYAN	6.7	1.3	5.1	2	0.4	2.8						
	ARSP							6.0	1.2	5.6	4	0.8	7.0
	ATCA							0.9	0.2	0.8	1	0.2	1.8
	GRSP							6.0	1.2	5.6	2	0.4	3.5
		131.0	26.5	100.0	72	14.4	100.1	107.2	21.4	99.9	57	11.4	100.0
MX 181 SS 7/4	CELA (d)	69.0	13.8	80.3	36	7.2	80.0	24.6	4.9	19.3	11	2.2	26.2
	HIJA	2.5	0.5	2.9	6	1.2	13.3	0.2	0.0	0.3	1	0.2	2.4
	GRSP (s)	13.2	2.6	15.4	2	0.4	4.4	24.2	4.8	18.9	4	0.8	9.5
	ATCA	1.2	0.2	1.4	1	0.2	2.2	34.6	6.9	27.1	13	2.6	31.0
	CHVI							43.5	8.7	34.0	12	2.4	28.6
	ARSP							0.7	0.1	0.6	1	0.2	2.4
		85.9	17.1	100.0	45	9.0	99.9	127.8	25.4	100.2	42	3.4	100.1

TABLE E-7 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Density (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Densit (%)
MX 181 SS 7/5	SIHY (s)	10.4	2.1	16.8	8	1.6	18.2	4.0	0.8	4.0	3	0.6	6.0
	ATCO (d)	39.3	7.9	63.4	24	4.8	54.6	81.0	16.2	80.7	36	7.2	72.0
	KOAM	4.7	0.9	7.6	5	1.0	11.4	6.8	1.4	6.8	5	1.0	10.0
	ATCA	0.6	0.1	1.0	1	0.2	2.3						
	CELA	7.0	1.4	11.3	6	1.2	13.6	8.6	1.7	8.6	6	1.2	12.0
		62.0	12.4	100.1	44	8.8	100.1	100.4	20.1	100.1	50	10.0	100.0
MX 181 SS 7/6	GUSA (d)	31.9	6.4	34.5	10	2.0	16.4	42.4	8.5	38.7	16	3.2	30.8
	ATCA							1.8	0.4	1.6	1	0.2	1.9
	HIJA	9.9	2.0	10.7	31	6.2	50.8	3.5	0.7	3.2	12	2.4	23.1
	CHVI (s)	22.4	4.5	24.2	8	1.6	13.1	36.3	7.3	33.1	13	2.6	25.0
	TEGL	22.8	4.6	24.6	6	1.2	9.8	23.9	4.8	21.8	9	1.8	17.3
	CELA							1.8	0.4	1.6	1	0.2	1.9
	ORHY	4.9	1.0	5.3	5	1.0	8.2						
	STPI	0.6	0.1	0.7	1	0.2	1.6						
		92.5	18.6	100.0	61	12.2	99.9	109.7	22.1	100.0	52	10.4	100.0
MX 181 SS 7/7	ATCO (d)	50.7	10.1	52.3	25	5.0	42.4	14.0	2.8	13.2	8	1.6	22.2
	CELA	7.2	1.4	7.4	3	0.6	5.1	23.1	4.6	21.8	10	2.0	27.8
	SIHY	20.3	4.1	20.9	14	2.8	23.7						
	KOAM	18.8	3.8	19.4	17	3.4	28.8						
	SUTO							1.9	0.4	1.8	2	0.4	5.6
	GUSA							9.7	1.9	9.2	2	0.4	5.6
	TESP							5.1	1.0	4.8	2	0.4	5.6
	CHVI (s)							42.4	8.5	40.1	9	1.8	25.0
	ATCA							1.3	0.3	1.2	1	0.2	2.8
	ORHY							1.0	0.2	1.0	1	0.2	2.8
	TEGL							7.3	1.5	6.9	1	0.2	2.8
		97.0	19.4	100.1	59	11.8	100.1	105.8	21.2	100.0	36	7.2	100.2
MX 181 SS 7/8	CHVI (d)	49.2	9.8	76.0	24	4.8	66.7	26.6	5.3	26.3	12	2.4	30.8
	TEGL	3.6	0.7	5.6	1	0.2	2.8	18.6	3.7	18.4	6	1.2	15.4
	GUSA (s)	7.1	1.4	11.0	4	0.8	11.1	51.4	10.3	50.7	18	3.6	46.2
	ORHY	1.5	0.3	2.3	1	0.2	2.8	4.5	0.9	4.4	2	0.4	5.1
	ATCA							0.2	0.0	0.2	1	0.2	2.6
	CELA	0.5	0.1	0.8	1	0.2	2.8						
	ATCO	0.9	0.2	1.4	2	0.4	5.6						
	HIJA	1.9	0.4	3.0	3	0.6	8.3						
		64.7	12.9	100.1	36	7.2	100.1	101.3	20.2	100.0	39	[illegible].8	100.1

TABLE E-7 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Density (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Densit (%)
MX 181 SS 7/9	CELA	9.7	1.9	8.8	8	1.6	13.8	1.1	0.2	1.3	1	0.2	1.2
	HIJA (s)	4.3	0.9	3.9	18	3.6	31.0	35.5	7.1	40.4	55	11.0	64.7
	CHVI (d)	61.2	12.2	55.3	18	3.6	31.0	38.2	7.6	43.5	15	3.0	17.7
	ATCA	22.6	4.5	20.4	9	1.8	15.5	0.7	0.1	0.8	1	0.2	1.2
	TEGL	9.2	1.8	8.3	3	0.6	5.2						
	ORHY	3.7	0.7	3.3	2	0.4	3.5	11.4	2.3	13.0	11	2.2	12.9
	SIHY							1.0	0.2	1.1	2	0.4	2.4
		110.7	22.0	100.0	58	11.6	100.0	87.9	17.5	100.1	85	17.0	100.1
MX 181 SS 7/10	HIJA	7.5	1.5	6.2	17	3.4	30.9	4.7	0.9	4.6	17	3.4	31.5
	TEGL (d)	39.9	8.0	33.2	9	1.8	16.4	28.6	5.7	28.0	8	1.6	14.8
	EPNE (s)	29.8	6.0	24.8	9	1.8	16.4	31.7	6.3	31.1	11	2.2	20.4
	CHVI	29.9	6.0	24.9	9	1.8	16.4	30.9	6.2	30.3	8	.6	14.8
	ORHY	8.1	1.6	6.7	8	1.6	14.6	4.0	0.8	3.9	8	1.6	14.8
	CELA	0.6	0.1	0.5	1	0.2	1.8	0.5	0.1	0.5	1	0.2	1.9
	ATCA	0.8	0.2	0.7	1	0.2	1.8	1.7	0.3	1.7	1	0.2	1.9
	GUSA	3.6	0.7	3.0	1	0.2	1.8						
		120.2	24.1	100.0	55	11.0	100.1	102.1	20.3	100.1	54	10.8	100.1
MX 181 SS 7/11	CHNA	35.2	7.0	23.7	5	1.0	12.8						
	CHVI (d)	27.4	5.5	18.4	7	1.4	18.0	56.1	11.2	49.0	18	3.6	45.0
	GUSA	12.9	2.6	8.7	5	1.0	12.8						
	ARTR	4.0	0.8	2.7	1	0.2	2.6						
	ATCA	2.9	0.6	2.0	1	0.2	2.6						
	CELA	3.1	0.6	2.1	3	0.6	7.7						
	ORHY	6.4	1.3	4.3	5	1.0	12.8						
	SIHY	0.8	0.2	0.5	1	0.2	2.6						
	EPNE (s)	45.5	9.1	30.6	5	1.0	12.8	23.2	4.6	20.3	7	1.4	17.5
	ATCO	10.5	2.1	7.1	6	1.2	15.4	2.5	0.5	2.2	1	0.2	2.5
	TEGL							31.1	6.2	27.2	10	2.0	25.0
	HIJA							0.5	0.1	0.4	2	0.4	5.0
	SUTO							1.1	0.2	1.0	2	0.4	5.0
		148.7	29.8	100.1	39	7.8	100.1	114.5	22.8	100.1	40	8.0	100.0

TABLE E-7 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181 SS 7/12	ORHY	6.7	1.3	5.5	5	1.0	12.8						
	KOAM	1.0	0.2	0.8	3	0.6	7.7	15.6	3.1	16.4	13	2.6	25.0
	TEGL	33.8	6.8	27.8	8	1.6	20.5						
	CHVI (s)	46.0	9.2	37.9	14	2.8	35.9						
	EPNE	31.7	6.3	26.1	6	1.2	15.4						
	SIHY	0.3	0.1	0.3	1	0.2	2.6	0.5	0.1	0.5	1	0.2	1.9
	CELA	1.9	0.4	1.6	2	0.4	5.1	8.8	1.8	9.3	5	1.0	9.6
	ATCO (d)							58.7	11.7	61.7	26	5.2	50.0
	ATCA							5.0	1.0	5.3	3	0.6	5.8
	ARSP							6.5	1.3	6.8	4	0.8	7.8
		121.4	24.3	100.0	39	7.8	100.0	95.1	19.0	100.0	52	10.4	100.1
MX 181 SS 7/13	CHVI (d)	76.8	15.4	76.8	28	5.6	49.1	79.4	15.9	84.4	37	7.4	78.7
	ORHY (s)	15.1	3.0	15.1	12	2.4	21.1	5.9	1.2	6.3	6	1.2	12.8
	CELA	1.1	0.2	1.1	3	0.6	5.3	4.0	0.8	4.3	1	0.2	2.1
	HIJA	2.1	0.4	2.1	11	2.2	19.3						
	ATEA	4.9	1.0	4.9	3	0.6	5.3						
	EPNE							4.8	1.0	5.1	3	0.6	6.4
		100.0	20.0	100.0	57	11.4	100.1	94.1	18.9	100.1	47	9.4	100.0
MX 181 SS 7/14	ATCA	17.5	3.5	15.4	3	0.6	3.8						
	HIJA	17.8	3.6	15.6	36	7.2	45.0						
	ORHY	36.7	7.3	32.2	30	6.0	37.5						
	GUSA	22.8	4.6	20.0	4	0.8	5.0						
	SIHY	2.9	0.6	2.6	2	0.4	2.5	0.7	0.1	0.6	2	0.4	3.1
	CELA (s)	3.5	0.7	3.1	2	0.4	2.5	47.4	9.5	41.5	27	5.4	41.5
	CHVI	12.7	2.5	11.2	3	0.6	3.8						
	ATCO (d)							68.2	13.6	58.1	34	6.8	52.3
	KOAM							1.1	0.2	0.9	2	0.4	3.0
		113.9	22.8	100.1	80	16.0	100.1	117.4	23.4	101.1	65	13.0	99.9
MX 181 SS 7/15	CHVI (d)	91.9	18.4	79.9	28	5.6	57.1	37.6	7.5	36.5	12	2.4	25.5
	ATCA	2.0	0.4	1.7	1	0.2	2.0	18.1	3.6	17.6	7	1.4	14.9
	CELA (s)	12.0	2.4	10.4	9	1.8	18.4	33.8	6.8	32.9	21	4.2	44.7
	HIJA	2.1	0.4	1.8	9	1.8	18.4						
	ORHY	0.5	0.1	0.4	1	0.2	2.0	0.8	0.2	0.8	1	0.2	2.1
	GRSP	6.5	1.3	5.7	1	0.2	2.0						
	ARSP							12.6	2.5	12.2	6	1.2	12.8
		115.0	23.0	99.9	49	9.8	99.9	102.9	20.6	100.0	47	9.4	100.0

TABLE E-7 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CELA (d)	76.8	15.4	85.5	49	9.8	70.0	84.9	17.0	93.0	44	8.8	84.6
SS 7/16	ORHY	2.9	0.6	3.2	11	2.2	15.7	3.3	0.7	3.6	6	1.2	11.6
	ATCA (s)	10.1	2.0	11.3	10	2.0	14.3	2.5	0.5	2.7	1	0.2	1.9
	SIHY							0.6	0.1	0.7	1	0.2	1.9
		89.8	18.0	100.0	70	14.0	100.0	91.3	18.3	100.0	52	10.4	100.0
MX 181	GRSP (d)	41.2	8.2	41.6	7	1.4	15.9	41.5	8.3	26.5	7	1.4	20.0
SS 7/17	ATCA	28.1	5.6	28.4	16	3.2	36.4	7.5	1.5	4.8	5	1.0	14.3
	CHVI							45.8	9.2	29.3	10	2.0	28.6
	ORHY	0.2	0.0	0.2	1	0.2	2.3	1.2	0.2	0.8	1	0.2	2.9
	LYAN (s)							55.6	11.1	35.5	9	1.8	25.7
	CELA	0.3	0.1	0.3	1	0.2	2.3	5.0	1.0	3.2	3	0.6	8.6
	SIHY	8.1	1.6	8.2	9	1.8	20.5						
	GUSA	12.9	2.6	13.0	4	0.8	9.1						
	ARSP	8.3	1.7	8.4	6	1.2	13.6						
		99.1	19.8	100.1	44	8.8	100.1	156.6	31.3	100.1	35	7.0	100.1
MX 181	HIJA	33.5	6.7	23.2	34	6.8	47.9	6.5	1.3	3.7	13	2.6	25.0
SS 7/18	ORHY	1.9	0.4	1.3	1	0.2	1.4						
	CHVI (s)	18.4	3.7	12.8	4	0.8	5.6	43.3	8.7	24.3	13	2.6	25.0
	GRSP (d)	53.2	10.6	36.9	9	1.8	12.7	65.4	13.1	36.7	15	3.0	28.9
	CELA	11.9	2.4	8.3	8	1.6	11.3	7.0	1.4	3.9	5	1.0	9.6
	ARSP	23.2	4.6	16.1	11	2.2	15.5						
	SIHY	2.1	0.4	1.5	4	0.8	5.6						
	LYAN							55.8	11.2	31.4	6	1.2	11.5
		144.2	28.8	100.1	71	14.2	100.0	178.0	35.7	100.0	52	10.4	100.0
MX 181	ATCO	18.8	3.8	16.8	11	2.2	22.0	13.3	2.7	8.3	8	1.6	13.8
SS 7/19	HIJA	3.0	0.6	2.7	1	0.2	2.0	4.0	0.8	2.5	9	1.8	15.5
	ORHY	4.0	0.8	3.6	3	0.6	6.0	1.9	0.4	1.2	2	0.4	3.5
	CHVI (d)	19.3	3.9	17.2	5	1.0	10.0	106.1	21.2	65.8	30	6.0	51.7
	CELA	19.3	3.9	17.2	14	2.8	28.0	4.4	0.9	2.7	2	0.4	3.5
	TEGL (s)	17.2	3.4	15.3	2	0.4	4.0	28.5	5.7	17.7	5	1.0	8.6
	ATCA	4.9	1.0	4.4	1	0.2	2.0	1.5	0.3	0.9	1	0.2	1.7
	GRSP	7.4	1.5	6.6	2	0.4	4.0						
	ARSP	18.3	3.7	16.3	11	2.2	22.0						
		112.2	22.4	100.0	50	10.0	100.0	161.2	32.3	100.0	58	11.6	100.0

TABLE E-7 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181	HIJA	12.6	2.5	7.2	25	5.0	38.5						
SS 7/20	ARSP	3.5	0.7	2.0	3	0.6	4.6	13.0	2.6	13.5	11	2.2	16.4
	CHVI (d)	109.2	21.8	61.9	23	4.6	35.4						
	KOAM	3.7	0.7	2.1	2	0.4	3.1	31.6	6.3	32.9	27	5.4	40.3
	GRSP	31.1	6.2	17.6	5	1.0	7.7						
	ATCO (d)	2.1	0.4	1.2	1	0.2	1.5	51.6	10.3	53.6	29	5.8	43.3
	ATCA	12.1	2.4	6.9	5	1.0	7.7						
	ORHY	2.0	0.4	1.1	1	0.2	1.5						
		176.3	35.1	100.0	65	13.0	100.0	96.2	19.2	100.0	67	13.4	100.0
MX 181	ATCO (d)	41.8	8.4	37.0	20	4.0	31.8	76.4	15.3	50.0	28	5.6	40.1
SS 7/21	CELA	9.2	1.8	8.1	5	1.0	7.9	11.1	2.2	7.3	6	1.2	8.6
	ARSP (s)	42.8	8.6	37.9	24	4.8	38.1	60.2	12.0	39.4	30	6.0	42.9
	KOAM	19.2	3.8	17.0	14	2.8	22.2	4.3	0.9	2.8	5	1.0	7.1
	SIHY							0.8	0.2	0.5	1	0.2	1.4
		113.0	22.6	100.0	63	12.6	100.0	152.8	30.6	100.0	70	14.0	100.1
MX 181	TEGL (s)	1.5	0.3	1.6	1	0.2	1.6	69.2	13.8	41.5	17	3.4	34.0
SS 7/22	CHVI (d)	5.9	1.2	6.1	4	0.8	6.4	85.7	17.1	51.4	30	6.0	60.0
	ATCA							3.3	0.7	2.0	2	0.4	4.0
	EPNE							8.4	1.7	5.0	1	0.2	2.0
	ATCO	25.6	5.1	26.4	15	3.0	23.8						
	ORHY	11.4	2.3	11.8	9	1.8	14.3						
	CELA	31.4	6.3	32.4	24	4.8	38.1						
	ARSP	21.2	4.2	21.9	10	2.0	15.9						
		97.0	19.4	100.2	63	12.6	100.1	166.6	33.3	99.9	50	10.0	100.0
MX 181	ARSP	9.5	1.9	9.2	4	0.8	5.7	4.4	0.9	5.1	2	0.4	3.6
SS 7/23	ATCO (d)	54.6	10.9	52.9	32	6.4	45.7	52.8	10.6	61.3	28	5.6	50.9
	KOAM (s)	39.2	7.8	38.0	34	6.8	48.6	27.7	5.5	32.2	24	4.8	43.7
	SIHY							1.2	0.2	1.4	1	0.2	1.8
		103.3	20.6	100.1	70	14.0	100.0	86.1	17.2	100.0	55	11.0	100.0

TABLE E-8
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 8

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ATCO							7.1	1.4	9.0	3	0.6	7.7
SS 8/1	CHGR (s)	34.6	6.9	36.7	9	1.8	22.0	27.1	5.4	34.2	14	2.8	35.9
	GUMI (d)	41.0	8.2	43.5	13	2.6	31.7	17.3	3.5	21.8	8	1.6	20.5
	TEGL	3.5	0.7	3.7	1	0.2	2.4	16.4	3.3	20.7	4	0.8	10.3
	Unknown COMP							3.2	0.6	4.0	1	0.2	2.6
	HIJA	7.0	1.4	7.4	13	2.6	31.7						
	ORHY	4.0	0.8	4.2	2	0.4	4.9	1.5	0.3	1.9	2	0.4	5.1
	SIHY	4.2	0.8	4.5	3	0.6	7.3	6.6	1.3	8.3	7	1.4	18.0
		94.3	18.8	100.0	41	8.2	100.0	79.2	15.8	99.9	39	7.8	100.1
MX 181	ATCO (d)	71.5	14.3	54.0	31	6.2	56.4	113.1	22.6	78.1	49	9.8	77.7
SS 8/2	CELA (s)	60.9	12.2	46.0	24	4.8	43.6	31.8	6.4	22.0	14	2.8	22.2
		132.4	26.5	100.0	55	11.0	100.0	144.9	29.0	100.0	63	12.6	99.9
MX 181	ARSP (s)	0.2	0.0	0.2	1	0.2	1.6	50.7	10.1	44.6	28	5.6	50.0
SS 8/3	ATCO (d)	1.2	0.2	0.9	1	0.2	1.6	28.7	5.7	25.2	14	2.8	25.0
	CELA	2.5	0.5	1.9	3	0.6	4.9	34.4	6.9	30.2	14	2.8	25.0
	CHGR	117.6	23.5	89.3	30	6.0	49.2						
	HIJA	7.7	1.5	5.9	22	4.4	36.1						
	ORHY	2.5	.5	1.9	4	0.8	6.6						
		131.7	26.2	100.1	61	12.2	100.0	113.8	22.7	100.0	56	11.2	100.0
MX 181	CH (s)							54.4	10.9	34.3	15	3.0	14.3
SS 8/4	CELA (d)	143.3	28.7	98.8	67	13.4	95.7	78.6	15.7	49.5	41	8.2	39.1
	ATGA							3.7	0.7	2.3	3	0.6	2.9
	ORHY	0.3	0.1	0.2	1	0.2	1.4	7.0	1.4	4.4	10	2.0	9.5
	HIJA							15.1	3.0	9.5	36	7.2	34.3
	SIHY	1.4	0.3	1.0	2	0.4	2.9						
		145.0	29.1	100.0	70	14.0	100.0	158.8	31.7	100.0	105	21.0	100.1
MX 181	ATCA	23.5	4.7	17.9	7	1.4	13.2						
SS 8/5	CELA (d)	34.5	6.9	26.3	22	4.4	41.5	69.3	13.9	53.7	33	6.6	47.8
	CH (s)	59.5	11.9	45.3	12	2.4	22.6						
	ORHY	12.3	2.5	9.4	11	2.2	20.8						
	SIHY	1.5	0.3	1.1	1	0.2	1.9	0.3	0.1	0.2	1	0.2	1.5
	ATCO							58.9	11.8	45.7	32	6.4	46.4
	ARSP							0.5	0.1	0.4	3	0.6	4.4
		131.3	26.3	100.0	53	10.6	100.0	129.0	25.9	100.0	69	13.8	100.1

TABLE E-8 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CELA (s)	26.8	5.4	26.0	19	3.8	14.7	29.7	5.9	21.0	20	4.0	23.8
SS 8/6	HIJA	43.7	8.7	42.3	79	15.8	61.2	11.3	2.3	8.0	23	4.6	27.4
	ORHY	29.4	5.9	28.5	28	5.6	21.7	14.3	2.9	10.1	13	2.6	15.5
	SPCR	3.3	0.7	3.2	3	0.6	2.3	14.6	2.9	10.3	12	2.4	14.3
	ATCA (d)							68.2	13.6	48.2	15	3.0	17.9
	GUMI							3.5	0.7	2.5	1	0.2	1.2
		103.2	20.7	100.0	129	25.8	99.9	141.6	28.3	100.1	84	16.8	100.1
MX 181	ATCO (d)	97.0	19.4	84.7	45	9.0	83.3	47.3	9.5	58.7	21	4.2	48.8
SS 8/7	CELA (s)	14.5	2.9	12.7	6	1.2	11.1	27.0	5.4	33.5	16	3.2	37.2
	CH							3.3	0.7	4.1	2	0.4	4.7
	ORHY	2.0	0.4	1.8	2	0.4	3.7	1.7	0.3	2.1	2	0.4	4.7
	SIHY	1.0	0.2	0.9	1	0.2	1.9	1.3	0.3	1.6	2	0.4	4.7
		114.5	22.9	100.1	54	10.8	100.0	80.6	16.2	100.0	43	8.6	100.1
MX 181	HIJA (d)	115.5	23.1	95.5	168	33.6	95.5	51.4	10.3	50.3	107	21.4	69.0
SS 8/8	ORHY	1.5	0.3	1.2	2	0.4	1.1	17.0	3.4	16.6	21	4.2	13.6
	CELA (s)	1.9	0.4	1.6	2	0.4	1.1	29.3	5.9	28.7	26	5.2	16.8
	ATCA							4.5	0.9	4.4	1	0.2	0.7
	SPCR	2.1	0.4	1.7	4	0.8	2.3						
		121.0	24.2	100.0	176	35.2	100.0	102.2	20.5	100.0	155	31.0	100.1
MX 181	CELA	45.8	9.2	37.5	23	4.6	39.0	7.9	1.6	4.7	7	1.4	14.6
SS 8/9	ATCO (s)	73.8	14.8	60.4	28	5.6	47.5	1.5	0.3	0.9	1	0.2	2.1
	ORHY	2.3	0.5	1.9	7	1.4	11.9						
	SIHY	0.3	0.1	0.3	1	0.2	1.7	1.6	0.3	1.0	4	0.8	8.3
	ARTR (d)							104.7	20.9	62.1	24	4.8	50.0
	ATCA							52.9	10.6	31.4	12	2.4	25.0
		122.2	24.6	100.1	59	11.8	100.1	168.6	33.7	100.1	48	9.6	100.0
MX 181	HIJA (d)	61.8	12.4	56.0	85	17.0	69.1	4.4	0.9	5.1	4	0.8	13.8
SS 8/10	CELA	24.4	4.9	22.1	22	4.4	17.9	5.1	1.0	6.0	4	0.8	13.8
	ARSP	23.5	4.7	21.3	15	3.0	12.2						
	GRSP	0.6	0.1	0.5	1	0.2	0.8	4.0	0.8	4.7	2	0.4	6.9
	ARTR							3.7	0.7	4.3	1	0.2	3.5
	LYAN (s)							30.6	6.1	35.7	6	1.2	20.7
	ATCA							24.2	4.8	28.2	7	1.4	24.1
	SIHY							2.5	0.5	2.9	1	0.2	3.5
	GUSA							11.2	2.2	13.1	4	0.8	13.8
		110.3	22.1	99.9	123	24.6	100.0	85.7	17.0	100.0	29	5.8	100.1

TABLE E-8 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181	CH (d)	68.3	13.7	96.5	33	6.6	89.2	137.9	27.6	85.3	47	9.4	75.8
SS 8/11	CELA (s)	1.0	0.2	1.4	1	0.2	2.7	22.3	4.5	13.8	12	2.4	19.4
	ORHY	1.5	0.3	2.1	3	0.6	8.1	1.4	0.3	0.9	3	0.6	4.8
		70.8	14.2	100.0	37	7.4	100.0	161.6	32.4	100.0	62	12.4	100.0
MX 181	ARTR (d)	63.2	12.6	67.7	17	3.4	58.6	88.8	17.8	74.4	22	4.4	55.0
SS 8/12	GRSP							14.3	2.9	12.0	3	0.6	7.5
	CHVI (s)	8.1	1.6	8.7	6	1.2	20.7	10.0	2.0	8.4	6	1.2	15.0
	SIHY							4.6	0.9	3.9	6	1.2	15.0
	ORHY							0.1	0.0	0.1	1	0.2	2.5
	TEGL	8.0	1.6	8.6	2	0.4	6.9	1.5	0.3	1.3	2	0.4	5.0
	EPNE	14.1	2.8	15.1	4	0.8	13.8						
		93.4	18.6	100.1	29	5.8	100.0	119.3	23.9	100.1	40	8.0	100.0
MX 181	CH (d)	61.6	12.3	52.0	22	4.4	35.5	88.7	17.7	59.7	21	4.2	31.3
SS 8/13	CELA (s)	52.4	10.5	44.3	34	6.8	54.8	52.9	10.6	35.6	31	6.2	46.3
	ORHY	1.8	0.4	1.5	3	0.6	4.8	5.4	1.1	3.6	8	1.6	11.9
	SPCR	2.6	0.5	2.2	3	0.6	4.8						
	HIJA							1.6	0.3	1.1	7	1.4	10.5
		118.4	23.7	100.0	62	12.4	99.9	148.6	29.7	100.0	67	13.4	100.0
MX 181	CHVI (s)	30.0	6.0	23.2	9	1.8	26.5	56.4	11.3	44.0	16	3.2	53.3
SS 8/14	ARTR (d)	57.8	11.6	44.7	15	3.0	44.1	42.8	8.6	33.4	7	1.4	23.3
	CELA							1.1	0.2	0.9	1	0.2	3.3
	SIHY							1.5	0.3	1.2	1	0.2	3.3
	TEGL							5.5	1.1	4.3	1	0.2	3.3
	GRSP	8.4	1.7	6.5	3	0.6	8.8	3.3	0.7	2.6	2	0.4	6.7
	LYAN	11.6	2.3	9.0	3	0.6	8.8	17.6	3.5	13.7	2	0.4	6.7
	ORHY	1.0	0.2	0.8	1	0.2	2.9						
	EPNE	14.4	2.9	11.2	2	0.4	5.9						
	GUSA	6.0	1.2	4.6	1	0.2	2.9						
		129.2	25.9	100.0	34	6.8	99.9	128.2	25.7	100.1	30	6.0	99.9

TABLE E-8 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CRHY	17.4	3.5	17.8	18	3.6	32.1	16.1	3.2	11.5	16	3.2	20.0
SS 8/15	CELA (d)	63.1	12.6	64.4	30	6.0	53.6	70.0	14.0	49.8	33	6.6	41.3
	CH (s)	12.0	2.4	12.2	6	1.2	10.7	40.7	8.1	29.0	15	3.0	18.8
	ATCA	5.5	1.1	5.6	2	0.4	3.6	9.0	1.8	6.4	2	0.4	2.5
	SIHY							1.1	0.2	0.8	2	0.4	2.5
	HIJA							3.7	0.7	2.6	12	2.4	15.0
		98.0	19.6	100.0	56	11.2	100.0	140.6	28.0	100.1	80	16.0	100.1
MX 181	ARTR (d)	127.4	25.5	81.3	29	5.8	82.9	111.8	22.4	98.1	31	6.2	88.6
SS 8/16	GRSP	3.4	0.7	2.2	2	0.4	5.7	1.0	0.2	0.9	1	0.2	2.9
	EPNE (s)	17.7	3.5	11.3	3	0.6	8.6	0.1	0.0	0.1	1	0.2	2.9
	TEAX	8.2	1.6	5.2	1	0.2	2.9						
	SIHY							1.1	0.2	1.0	2	0.4	5.7
		156.7	31.3	100.0	35	7.0	100.1	114.0	22.8	100.1	35	7.0	100.1
MX 181	ARTR (d)	144.4	28.9	86.7	30	6.0	79.0	111.3	22.3	80.4	21	4.2	65.6
SS 8/17	GRSP	4.9	1.0	2.9	2	0.4	5.3	1.5	0.3	1.1	1	0.2	3.1
	CELA	1.8	0.4	1.1	1	0.2	2.6						
	LYAN	8.7	1.7	5.2	2	0.4	5.3						
	EPNE	2.6	0.5	1.5	2	0.4	5.3						
	TEGL	4.2	0.8	2.5	1	0.2	2.6						
	HYSA							2.3	0.5	1.7	2	0.4	6.3
	GUSA							9.8	2.0	7.1	4	0.8	12.5
	ATCA (s)							11.5	2.3	8.3	2	0.4	6.3
	HIJA							0.8	0.2	0.6	1	0.2	3.1
	VIMU							1.2	0.2	0.9	1	0.2	3.1
		166.6	33.3	99.9	38	7.6	100.1	138.4	27.8	100.1	32	6.4	100.0
MX 181	CHVI	8.1	1.6	5.7	4	0.8	10.3						
SS 8/18	STCO	0.5	0.1	0.4	1	0.2	2.6						
	GUSA	2.1	0.4	1.5	1	0.2	2.6						
	CRHY	4.7	0.9	3.3	4	0.8	10.3	9.2	1.8	5.8	7	1.4	17.1
	ARTR (d)	70.7	14.1	50.0	16	3.2	41.0	128.2	25.6	80.3	27	5.4	65.9
	PRFA	26.4	5.3	18.7	3	0.6	7.7						
	COME	12.8	2.6	9.1	3	0.6	7.7						
	SIHY	4.2	0.8	3.0	4	0.8	10.3	2.3	0.5	1.4	2	0.4	4.9
	EPNE (s)	10.3	2.1	7.3	2	0.4	5.1	18.3	3.7	11.5	3	0.6	7.3
	HYSA	1.5	0.3	1.1	1	0.2	2.6						
	VIMU							1.7	0.3	1.1	2	0.4	4.9
		141.3	28.2	100.1	39	7.8	100.2	159.7	31.9	100.1	41	8.2	100.1

TABLE E-8 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	GUSA	1.3	0.3	2.5	2	0.4	3.1	7.9	1.6	4.5	4	0.8	6.4
SS 8/19	Stipa sp							5.5	1.1	3.1	8	1.6	12.7
	ARTR (d)	45.3	9.1	86.8	38	7.6	58.5	142.4	28.5	81.4	40	8.0	63.5
	EPNE (s)	0.8	0.2	1.5	1	0.2	1.5	12.0	2.4	6.9	3	0.6	4.8
	ORHY	1.1	0.2	2.1	5	1.0	7.7	1.0	0.2	0.6	1	0.2	1.6
	SIHY							5.5	1.1	3.1	5	1.0	7.9
	HIJA	3.0	0.6	5.7	17	3.4	26.2	0.7	0.1	0.4	2	0.4	3.2
	GRSP	0.6	0.1	1.1	1	0.2	1.5						
	CO	0.1	0.0	0.2	1	0.2	1.5						
		52.2	10.5	99.9	65	13.0	100.0	175.0	35.0	100.0	63	12.6	100.1
MX 181	ARTR (d)	110.7	22.1	90.8	31	6.2	83.8	126.7	25.3	71.1	28	5.6	65.1
SS 8 /20	EPNE (s)	5.3	1.1	4.4	2	0.4	5.4	35.2	7.0	19.7	9	1.8	20.9
	TEGL	1.8	0.4	1.5	1	0.2	2.7	5.3	1.1	3.0	1	0.2	2.3
	CHVI	3.8	0.8	3.1	2	0.4	5.4	5.6	1.1	3.1	1	0.2	2.3
	ORHY	0.3	0.1	0.3	1	0.2	2.7	1.5	0.3	0.8	1	0.2	2.3
	SIHY							4.0	0.8	2.2	3	0.6	7.0
		121.9	24.5	100.1	37	7.4	100.0	178.3	35.6	99.9	43	8.6	99.9
MX 181	EPNE (s)	22.0	4.4	25.5	6	1.2	19.4	34.2	6.8	25.1	6	1.2	17.1
SS 8/21	ARTR (d)	48.3	9.7	56.0	15	3.0	48.4	80.5	16.1	59.1	22	4.4	62.9
	CHVI	15.4	3.1	17.8	9	1.8	29.0	14.3	2.9	10.5	4	0.8	11.4
	SIHY	0.6	0.1	0.7	1	0.2	3.2	1.1	0.2	0.8	1	0.2	2.9
	GUMI							0.1	0.0	0.0	1	0.2	2.9
	GRSP							6.1	1.2	4.5	1	0.2	2.9
		86.3	17.3	100.0	31	6.2	100.0	136.3	27.2	100.0	35	7.0	100.1

TABLE E-8 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARTR (d)	75.6	15.1	73.4	24	4.8	63.2	107.7	21.5	77.1	15	3.0	71.4
SS 8/22	EPNE	15.5	3.1	15.1	3	0.6	7.9						
	SIHY	1.1	0.2	1.1	2	0.4	5.3						
	CHVI	6.5	1.3	6.3	3	0.6	7.9	1.8	0.4	1.3	1	0.2	4.8
	ORHY	3.1	0.6	3.0	3	0.6	7.9						
	HIJA	1.2	0.2	1.2	3	0.6	7.9						
	ATCA (s)							19.7	3.9	14.1	2	0.4	9.5
	GRSP							4.0	0.8	2.9	2	0.4	9.5
	PRFA							6.5	1.3	4.7	1	0.2	4.8
		103.0	20.5	100.1	38	7.6	100.1	139.7	27.9	100.1	21	4.2	100.0
MX 181	ARTR (d)	87.1	17.4	65.3	20	4.0	46.5	122.3	24.5	61.8	21	4.2	48.8
SS 8/23	GUSA	7.6	1.5	5.7	4	0.8	9.3	12.4	2.5	6.3	7	1.4	16.3
	SIHY	3.4	0.7	2.6	3	0.6	7.0	0.6	0.1	0.3	1	0.2	2.3
	EPNE (s)	17.8	3.6	13.4	5	1.0	11.6	25.4	5.1	12.8	6	1.2	14.0
	HYSA	8.0	1.6	6.0	4	0.8	9.3	2.1	0.4	1.1	1	0.2	2.3
	CHVI	6.9	1.4	5.2	3	0.6	7.0	35.0	7.0	17.7	7	1.4	16.3
	OP	0.9	0.2	0.7	1	0.2	2.3						
	HIJA	1.6	0.3	1.2	3	0.6	7.0						
		133.3	26.7	100.1	43	8.6	100.0	197.8	39.6	100.0	43	8.6	100.0

TABLE E-9
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 9

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 9/1	CHVI (d)	65.4	13.1	77.3	29	5.8	44.6						
	CELA	7.4	1.5	8.8	8	1.6	12.3	1.5	0.3	1.1	2	0.4	5.0
	SIHY	2.0	0.4	2.4	2	0.4	3.1						
	HIJA	8.0	1.6	9.5	25	5.0	38.5	2.9	0.6	2.0	5	1.0	12.5
	ARSP	1.8	0.4	2.1	1	0.2	1.5						
	ARTR (s)							127.0	25.4	89.5	29	5.8	72.5
	GUTR							4.0	0.8	2.8	3	0.6	7.5
	EPNE							6.5	1.3	4.6	1	0.2	2.5
		84.6	17.0	100.1	65	13.0	100.0	141.9	28.4	100.0	40	8.0	100.0
MX 191 SS 9/2	GUTR (d)	114.5	22.9	69.5	26	5.2	56.5						
	CHGR (s)	48.7	9.7	29.6	19	3.8	41.3						
	CELA	1.5	0.3	0.9	1	0.2	2.2	25.7	5.1	95.5	21	4.2	95.5
	ARSP							1.2	0.2	4.5	1	0.2	4.6
		164.7	32.9	100.0	46	9.2	100.0	26.9	5.3	100.0	22	4.4	100.1
MX 181 SS 9/3	CELA (d)	114.8	23.0	91.3	67	13.4	89.3	109.5	21.9	91.1	73	14.6	83.9
	ORHY (s)	7.9	1.6	6.3	7	1.4	9.3	10.7	2.1	8.9	14	2.8	16.1
	ATCA	3.0	0.6	2.4	1	0.2	1.3						
		125.7	25.2	100.0	75	15.0	99.9	120.2	24.0	100.0	87	17.4	100.0
MX 181 SS 9/4	CELA (d)	137.4	27.5	98.0	76	15.2	93.8	33.7	6.7	37.8	31	6.2	42.5
	ORHY	2.8	0.6	2.0	5	1.0	6.2	17.1	3.4	19.2	25	5.0	34.3
	CH (s)							30.9	6.2	34.6	13	2.6	17.8
	SIHY							0.1	0.0	0.1	1	0.2	1.4
	ATCA							2.5	0.5	2.8	2	0.4	2.7
	ARSP							4.9	1.0	5.5	1	0.2	1.4
		140.2	28.1	100.0	81	16.2	100.0	89.2	17.8	100.0	73	14.6	100.1
MX 181 SS 9/5	CH (s)	46.3	9.3	43.7	15	3.0	31.9						
	ORHY	0.1	0.0	0.1	1	0.2	2.1	0.3	0.1	0.3	1	0.2	1.4
	CELA (d)	42.5	8.5	40.1	28	5.6	59.6	106.1	21.2	99.7	70	14.0	98.6
	ATCA	17.1	3.4	16.1	3	0.6	6.4						
		106.0	21.2	100.0	47	9.4	100.0	106.4	21.3	100.0	71	14.2	100.0

TABLE E-9 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARTR	12.6	2.5	9.9	3	0.6	5.9	33.9	6.8	26.5	6	1.2	14.3
SS 9/6	CELA (s)	57.2	11.5	45.3	35	7.0	68.6	16.6	3.3	13.0	13	2.6	31.0
	CHGR (d)	39.3	7.9	30.9	10	2.0	19.6	59.9	12.0	46.8	17	3.4	40.5
	GRSP	5.2	1.0	4.1	2	0.4	3.9	6.0	1.2	4.7	1	0.2	2.4
	TEGL	12.6	2.5	9.9	1	0.2	2.0	8.0	1.6	6.3	3	0.6	7.1
	ORHY							3.5	0.7	2.7	2	0.4	4.8
		126.9	25.4	100.1	51	10.2	100.0	127.9	25.6	100.0	42	8.4	99.7
MX 181	ARTR (d)	116.5	23.3	78.4	20	4.0	71.4	93.6	18.7	83.3	21	4.2	39.6
SS 9/7	CHGR (s)	24.6	4.9	16.6	7	1.4	25.0	9.4	1.9	8.4	7	1.4	13.2
	TEGL	7.5	1.5	5.1	1	0.2	3.6						
	HIJA							9.3	1.9	8.3	25	5.0	47.2
		148.6	29.7	100.1	28	5.6	100.0	112.3	22.5	100.0	53	10.6	100.0
MX 181	ARTR (d)	59.6	11.9	23.0	13	2.6	59.1	59.6	11.9	55.6	16	3.2	53.3
SS 9/8	CHGR (s)	19.0	3.8	23.3	5	1.0	22.7	41.1	8.2	38.4	10	2.0	33.3
	HIJA	3.1	0.6	3.8	4	0.8	18.2	0.1	0.0	0.0	1	0.2	3.3
	GRSP							6.3	1.3	5.9	3	0.6	10.0
		81.7	16.3	100.1	22	4.4	100.0	107.1	21.4	99.9	30	6.0	99.9
MX 181	CELA (d)	85.4	17.1	88.2	63	12.6	84.0	86.2	17.2	77.7	77	15.4	53.9
SS 9/9	ORHY	8.9	1.8	9.2	9	1.8	12.0	5.5	1.1	5.0	5	1.0	3.5
	SPCR	1.2	0.2	1.2	2	0.4	2.7	0.7	0.1	0.6	2	0.4	1.4
	ARSP	1.3	0.3	1.3	1	0.2	1.3						
	HIJA (s)							18.5	3.7	16.7	59	11.8	41.3
		96.8	19.4	99.9	75	15.0	100.0	110.9	22.1	100.0	143	28.6	100.1
MX 181	HIJA (d)	44.2	8.8	64.2	79	15.8	85.9	21.3	4.3	22.2	45	9.0	59.2
SS 9/10	GRSP	4.4	0.9	6.4	1	0.2	1.1	15.5	3.1	16.1	3	0.6	4.0
	ARTR	5.3	1.1	7.7	1	0.2	1.1						
	CH (s)	14.9	3.0	21.7	11	2.2	12.0	41.9	8.4	43.6	18	3.6	23.7
	SIHY							2.2	0.4	2.3	1	0.2	1.3
	ARSP							11.8	2.4	12.3	6	1.2	7.9
	ATCA							3.4	0.7	3.5	3	0.6	4.0
		68.8	13.8	100.0	92	18.4	100.1	96.1	19.3	99.7	76	15.2	100.1

TABLE E-9 (Cont.)

Sample Unit #	Plant Species	Transect 1						Transect 2					
		Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 9/11	ARTR (d)	79.7	15.9	81.2	27	5.4	54.0	79.0	15.8	69.1	13	2.6	24.1
	HIJA (s)	10.3	2.1	10.5	19	3.8	38.0	12.5	2.5	10.9	35	7.0	64.8
	CHVI	8.1	1.6	8.3	4	0.8	8.0						
	GRSP							13.9	2.8	12.2	2	0.4	3.7
	ARPU							5.5	1.1	4.8	3	0.6	5.6
	CH							3.5	0.7	3.1	1	0.2	1.9
		98.1	19.6	100.0	50	10.0	100.0	114.4	22.9	100.1	54	10.8	100.1
MX 181 SS 9/12	HIJA (s)	10.6	2.1	9.6	15	3.0	40.5	58.6	11.7	39.4	78	15.6	83.9
	GRSP (d)	45.1	9.0	40.7	7	1.4	18.9	38.0	7.6	25.6	5	1.0	5.4
	CHGR	35.0	7.0	31.6	11	2.2	29.7						
	ARTR (s)	20.2	4.0	18.2	4	0.8	10.8	50.1	10.0	33.7	8	1.6	8.6
	ARSP							1.8	0.4	1.2	1	0.2	1.1
	CRHY							0.1	0.0	0.0	1	0.2	1.1
		110.9	22.1	100.1	37	7.4	99.9	148.6	29.7	99.9	93	18.6	100.1
MX 181 SS 9/13	ARTR (d)	93.4	18.7	93.5	26	5.2	89.7	86.1	17.2	78.3	20	4.0	60.6
	EPNE (s)	4.0	0.8	4.0	1	0.2	3.5	20.9	4.2	19.0	7	1.4	21.2
	HIJA	1.0	0.2	1.0	1	0.2	3.5	3.0	0.6	2.7	6	1.2	18.2
	SIHY	1.5	0.3	1.5	1	0.2	3.5						
		99.9	20.0	100.0	29	5.8	100.2	110.0	22.0	100.0	33	6.6	100.0
MX 181 SS 9/14	ARTR (d)	98.1	19.6	93.3	20	4.0	83.3	125.3	25.1	91.0	18	3.6	78.3
	SIHY	0.2	0.0	0.2	1	0.2	4.2						
	HIJA	0.6	0.1	0.6	2	0.4	8.3						
	EPNE (s)	6.3	1.3	6.0	1	0.2	4.2	2.5	0.5	0.9	1	0.2	4.4
	CHVI (s)							8.7	1.7	6.3	3	0.6	13.0
	OP							1.3	0.3	0.9	1	0.2	4.4
		105.2	21.0	100.1	24	4.8	100.0	137.8	27.6	100.0	23	4.6	100.1
MX 181 SS 9/15	ARTR (d)	120.4	24.1	92.4	34	6.8	75.6	147.9	29.6	92.8	43	8.6	86.0
	HIJA	2.6	0.5	2.0	9	1.8	20.0						
	EPNE	7.3	1.5	5.6	2	0.4	4.4	11.2	2.2	7.0	6	1.2	12.0
	SIHY							0.3	0.1	0.2	1	0.2	2.0
		130.3	26.1	100.0	45	9.0	100.0	159.4	31.9	100.0	50	10.0	100.0
MX 181 SS 9/16	ARTR (d)	139.8	28.0	92.6	37	7.4	74.0	114.9	23.0	64.7	24	4.8	42.1
	HIJA	5.6	1.1	3.7	10	2.0	20.0	16.6	3.3	9.4	24	4.8	42.1
	SIHY	2.5	0.5	1.7	1	0.2	2.0						
	EPNE (s)	3.0	0.6	2.0	2	0.4	4.0	35.4	7.1	19.9	6	1.2	10.5
	CHVI							10.6	2.1	6.0	3	0.6	5.3
		150.9	30.2	100.0	50	10.0	100.0	177.5	35.5	100.0	57	11.4	100.0

TABLE E-9 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 9/17	HIJA	67.8	13.6	39.7	110	22.0	80.3	8.4	1.7	5.9	12	2.4	30.0
	GRSP	31.5	6.3	18.5	5	1.0	3.7	11.1	2.2	7.8	3	0.6	7.5
	CELA	3.9	0.8	2.3	3	0.6	2.2						
	ARSP	3.5	0.7	2.1	1	0.2	0.7						
	CHVI (s)	62.4	12.5	36.6	17	3.4	12.4	23.1	4.6	16.1	3	0.6	7.5
	SIHY	1.5	0.3	0.9	1	0.2	0.7						
	ARTR (d)							97.9	19.6	68.4	20	4.0	50.0
	SP							2.6	0.5	1.8	2	0.4	5.0
		170.6	34.2	100.1	137	27.4	100.0	143.1	28.6	100.0	40	8.0	100.0
MX 181 SS 9/18	ARTR (d)	58.8	11.8	46.2	12	2.4	38.7	113.4	22.7	89.5	21	4.2	80.8
	CHVI (s)	53.6	10.7	42.1	13	2.6	41.9	9.3	1.9	7.3	3	0.6	11.5
	ORHY	2.5	0.5	2.0	2	0.4	6.5						
	GRSP	12.3	2.5	9.7	4	0.8	12.9	4.0	0.8	3.2	2	0.4	7.7
		127.2	25.5	100.0	31	6.2	100.0	126.7	25.4	100.0	26	5.2	100.0
MX 181 SS 9/19	ARTR (d)	125.5	25.1	97.1	31	6.2	73.8	128.1	25.6	74.3	26	5.2	44.8
	HIJA (s)	2.6	0.5	2.0	10	2.0	23.8	12.6	2.5	7.3	21	4.2	36.2
	EPNE	1.2	0.2	0.9	1	0.2	2.4	31.0	6.2	18.0	10	2.0	17.2
	SIHY							0.7	0.1	0.4	1	0.2	1.7
		129.3	25.8	100.0	42	8.4	100.0	172.4	34.4	100.0	58	11.6	99.9
MX 181 SS 9/20	ARTR (d)	93.6	18.7	80.6	19	3.8	76.0	98.5	19.7	70.8	21	4.2	53.9
	CHVI (s)	8.6	1.7	7.4	2	0.4	8.0	19.6	3.9	14.1	10	2.0	25.6
	GRSP	8.0	1.6	6.9	2	0.4	8.0	6.0	1.2	4.3	2	0.4	5.1
	EPNE	6.0	1.2	5.2	2	0.4	8.0	15.0	3.0	10.7	6	1.2	15.3
		116.2	23.2	100.1	25	5.0	100.0	139.1	27.8	99.9	39	7.8	99.9
MX 181 SS 9/21	ARTR (d)	56.8	11.4	55.7	15	3.0	60.0	83.4	16.7	74.9	18	3.6	51.4
	GRSP	6.5	1.3	6.4	2	0.4	8.0	4.0	0.8	3.6	1	0.2	2.9
	TEGL	22.5	4.5	22.1	3	0.6	12.0						
	CHVI (s)	16.2	3.2	15.9	5	1.0	20.0	15.9	3.2	14.3	4	0.8	11.4
	ORHY							2.2	0.4	2.0	1	0.2	2.9
	HIJA							5.3	1.1	4.8	10	2.0	28.5
	SIHY							0.5	0.1	0.5	1	0.2	2.9
		102.0	20.4	100.1	25	5.0	100.0	111.3	22.3	100.1	35	7.0	100.0

TABLE E-9 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CH (d)	82.6	16.5	84.5	29	5.8	58.0						
SS 9/22	HIJA	6.5	1.3	6.7	15	3.0	30.0						
	ORHY	1.5	0.3	1.5	3	0.6	6.0	4.6	0.9	5.5	4	0.8	9.8
	CELA (s)	4.1	0.8	4.2	2	0.4	4.0	71.8	14.4	86.5	32	6.4	78.1
	GU	3.0	0.6	3.1	1	0.2	2.0						
	SPCR							1.6	0.3	1.9	3	0.6	7.3
	ARSP							4.0	0.8	4.8	1	0.2	2.4
	SPCR							1.0	0.2	1.2	1	0.2	2.4
		97.7	19.5	100.0	50	10.0	100.0	83.0	16.6	99.9	41	8.2	100.0
MX 181	GUSA (d)	38.3	7.7	52.0	18	3.6	42.9						
SS 9/23	CELA	3.1	0.6	4.2	3	0.6	7.1						
	SPCR	9.5	1.9	12.9	11	2.2	26.2						
	ARSP	3.5	0.7	4.8	4	0.8	9.5						
	HIJA	0.4	0.1	0.5	2	0.4	4.8						
	ARNO (s)	14.4	2.9	19.5	5	0.4	4.8						
	CHVI	4.5	0.9	6.1	2	0.4	4.8						
		73.7	14.8	100.0	45	8.4	100.1						

TABLE E-10
TRANSECT RESULTS
DRY LAKE SHELTER SITES
CLUSTER 10

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARSP	5.8	1.2	6.0	2	0.4	4.0	6.2	1.2	7.2	3	0.6	3.8
SS 10/1	ATCA (s)	17.7	3.5	18.3	7	1.4	14.0	27.1	5.4	31.3	26	5.2	32.9
	CELA	41.2	8.2	42.7	25	5.0	50.0	47.1	9.4	54.5	39	7.8	49.4
	CH (d)	20.8	4.2	21.5	9	1.8	18.0						
	GRSP	7.3	1.5	7.6	3	0.6	6.0						
	ORHY	0.3	0.1	0.3	1	0.2	2.0	4.6	0.9	5.4	7	1.4	8.9
	SPCR	3.5	0.7	3.6	3	0.6	6.0						
	SIHY							1.0	0.2	1.2	2	0.4	2.5
	HIJA							0.5	0.1	0.6	2	0.4	2.5
		96.6	19.4	100.0	50	10.0	100.0	86.5	17.2	100.2	79	15.8	100.0
MX 181	CELA	21.0	4.2	16.9	15	3.0	17.1	9.6	1.9	8.6	9	1.8	11.0
SS 10/2	CH	6.0	1.2	4.8	2	0.4	2.3	26.3	5.3	23.6	12	2.4	14.6
	GRSP (d)	42.8	8.6	34.4	9	1.8	10.2	24.6	4.9	22.1	5	1.0	6.1
	HIJA	9.8	2.0	7.9	20	4.0	22.7	16.6	3.3	14.9	40	8.0	48.8
	ORHY	2.3	0.5	1.9	1	0.2	1.1	3.0	0.6	2.7	1	0.2	1.2
	SPCR (s)	42.4	8.5	34.1	41	8.2	46.6	10.4	2.1	9.3	8	1.6	9.8
	SIHY							2.8	0.6	2.5	2	0.4	2.4
	EPNE							18.0	3.6	16.2	5	1.0	6.1
		124.3	25.0	100.0	88	17.6	100.0	111.3	22.3	99.9	82	16.4	100.0
MX 181	CELA	1.0	0.2	0.9	1	0.2	1.3	3.2	0.6	3.2	2	0.4	2.4
SS 10/3	CH	25.4	5.1	23.7	7	1.4	9.3	4.7	0.9	4.7	3	0.6	3.5
	EPNE (d)	16.6	3.3	15.5	3	0.6	4.0	33.3	6.7	33.4	10	2.0	11.8
	GRSP	12.5	2.5	11.6	4	0.8	5.3	23.9	4.8	24.0	5	1.0	5.9
	HIJA	15.0	3.0	14.0	22	4.4	29.3	24.4	4.9	24.5	54	10.8	63.5
	ORHY	2.0	0.4	1.9	1	0.2	1.3						
	SIHY	1.3	0.3	1.2	2	0.4	2.7	1.3	0.3	1.3	1	0.2	1.2
	SPCR (s)	33.6	6.7	31.3	35	7.0	46.7	8.1	1.6	8.1	9	1.8	10.6
	ARSP							0.9	0.2	0.9	1	0.2	1.2
		107.4	21.5	100.1	75	15.0	99.9	99.8	20.0	100.0	00.1	17.0	100.1
MX 181	ATCA (s)	42.4	8.5	62.5	11	2.2	39.3						
SS 10/4	CELA (d)	22.8	4.6	33.8	15	3.0	53.6	131.3	26.3	98.9	99	19.8	98.0
	SIHY	0.5	0.1	0.7	1	0.2	3.6	1.5	0.3	1.1	2	0.4	2.0
	ORHY	1.8	0.4	2.9	1	0.2	3.6						
		67.5	13.6	99.9	28	5.6	100.1	132.8	26.6	100.0	101	20.2	100.0

TABLE E-10 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181	CELA (s)	53.6	10.7	37.5	31	6.2	51.7	55.3	11.1	44.6	35	7.0	50.3
SS 10/5	ARTR (d)	77.7	15.5	54.4	21	4.2	35.0	50.9	10.2	41.0	16	3.2	27.6
	SIHY	6.9	1.4	4.9	4	0.8	6.7	4.4	0.9	3.6	5	1.0	8.6
	ORHY	0.9	0.2	0.7	2	0.4	3.3						
	EPNE	1.5	0.3	1.1	1	0.2	1.7						
	CHVI	1.8	0.4	1.4	1	0.2	1.7						
	GRSP							13.6	2.7	10.8	2	0.4	3.5
		142.4	28.5	100.0	60	12.0	100.1	124.2	24.9	100.0	58	11.6	100.0
MX 181	ARTR (d)	52.1	10.4	59.1	13	2.6	65.0	111.9	22.4	80.9	21	4.2	77.8
SS 10/6	EPNE	1.2	0.2	1.1	1	0.2	5.0	17.6	3.5	12.6	3	0.6	11.1
	TEGL (s)	33.6	6.7	38.1	5	1.0	25.0	2.2	0.4	1.4	1	0.2	3.7
	CHVI	1.4	0.3	1.7	1	0.2	5.0						
	GRSP							7.0	1.4	5.1	2	0.4	7.4
		88.3	17.6	100.0	20	4.0	100.0	138.7	27.7	100.0	27	5.4	100.0
MX 181	CELA (d)	125.1	25.0	92.9	81	16.2	94.2	25.7	5.1	20.0	13	2.6	24.1
SS 10/7	ORHY	3.6	0.7	2.6	3	0.6	3.5	2.2	0.4	1.6	3	0.6	5.6
	CHVI (s)	6.1	1.2	4.5	2	0.4	2.3	90.0	18.0	70.9	32	6.4	59.3
	SIHY							0.5	0.1	0.4	1	0.2	1.9
	HIJA							1.5	0.3	1.2	3	0.6	5.6
	ARTR							7.7	1.5	5.9	2	0.4	3.7
		134.8	26.9	100.0	86	17.2	100.0	127.6	25.4	100.0	54	10.8	100.2
MX 181	HIJA (s)	28.1	5.6	33.3	45	9.0	61.6	22.4	4.5	19.9	46	9.2	48.4
SS 10/8	EPNE (d)	18.2	3.6	21.6	6	1.2	8.2	37.4	7.5	33.2	13	2.6	13.7
	CHGR	16.8	3.4	19.9	12	2.4	16.4	13.4	2.7	11.9	8	1.6	8.4
	SPCR	7.4	1.5	8.8	6	1.2	8.2	19.4	3.9	17.2	21	4.2	22.1
	GRSP	13.7	2.7	16.2	3	0.6	4.1	14.4	2.9	12.8	2	0.4	2.1
	CELA	0.2	0.0	0.2	1	0.2	1.4	1.5	0.3	1.3	1	0.2	1.1
	ARPU							4.1	0.8	3.6	4	0.8	4.2
		84.4	16.8	100.0	73	14.6	99.9	112.6	22.6	99.9	95	19.0	100.0

TABLE E-10 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARTR(d)	70.5	14.1	49.4	16	3.2	22.2	95.0	19.0	57.4	25	5.0	29.4
SS 10/9	TEGL	1.6	0.3	1.1	1	0.2	1.4						
	CELA(s)	41.8	8.4	29.3	29	5.8	40.3	38.5	7.7	23.3	30	6.0	35.3
	HIJA	7.7	1.5	5.4	18	3.6	25.0	22.8	4.6	13.8	24	4.8	28.2
	ORHY	2.7	0.5	1.9	2	0.4	2.8	3.0	0.6	1.8	4	0.8	4.7
	SIHY	1.9	0.4	1.3	1	0.2	1.4						
	GRSP	11.0	2.2	7.7	2	0.4	2.8	4.5	0.9	2.7	1	0.2	1.2
	LYAN	5.5	1.1	3.9	3	0.6	4.2						
	CHVI							1.7	0.3	1.0	1	0.2	1.2
		142.7	28.5	100.0	72	14.4	100.1	165.5	33.1	100.0	85	17.0	100.0
MX 181	HIJA (d)	79.2	15.8	61.4	94	18.8	86.2	47.3	9.5	46.2	90	18.0	85.7
SS 10/10	GRSP	9.2	1.8	7.1	2	0.4	1.8	6.8	1.4	6.6	2	0.4	1.9
	OPEC	0.7	0.1	0.5	1	0.2	0.9						
	EPNE (s)	20.7	4.1	16.1	5	1.0	4.6	42.3	8.5	41.3	7	1.4	6.7
	LYAN	4.0	0.8	3.1	1	0.2	0.9						
	CELA	1.2	0.2	0.9	1	0.2	0.9	1.4	0.3	1.4	1	0.2	1.0
	CHVI	11.3	2.3	8.8	2	0.4	1.8						
	ORHY	2.6	0.5	2.0	3	0.6	2.8	3.2	0.6	3.1	3	0.6	2.9
	ARPU							0.5	0.1	0.5	1	0.2	1.0
	SIHY							1.0	0.2	1.0	1	0.2	1.0
		128.9	25.6	99.9	109	21.8	99.9	102.5	20.6	100.0	105	21.0	100.2
MX 181	LYAN	4.5	0.9	4.7	1	0.2	2.3						
SS 10/11	CHVI (d)	35.0	7.0	38.6	9	1.8	20.9	73.5	14.7	50.1	24	4.8	32.4
	GRSP (s)	36.3	7.3	35.0	11	2.2	25.6	12.3	2.5	8.4	3	0.6	4.1
	HIJA	12.0	2.4	12.6	16	3.2	37.2	26.5	5.3	18.1	38	7.6	51.4
	SIHY	1.0	0.2	1.1	1	0.2	2.3						
	ORHY	1.7	0.3	1.8	2	0.4	4.7	3.1	0.6	2.1	1	0.2	1.4
	CELA	5.1	1.0	5.3	3	0.6	7.0	1.0	0.2	0.7	1	0.2	1.4
	SPCO							1.5	0.3	1.0	1	0.2	1.4
	ATCA							12.3	2.5	8.4	3	0.6	4.1
	EPNE							15.4	3.1	10.5	2	0.4	2.7
	OPEC							1.1	0.2	0.8	1	0.2	1.4
		95.6	19.1	99.1	43	8.6	100.0	145.7	29.4	100.1	74	14.8	100.3

TABLE E-10 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
MX 181	HIJA	11.0	2.2	7.9	22	4.4	37.3	9.6	1.9	7.3	17	3.4	38.6
SS 10/12	GRSP	19.5	3.9	13.9	2	0.4	3.4						
	EPNE	19.0	3.8	13.5	5	1.0	8.5	5.5	1.1	4.2	3	0.6	6.8
	ARSP	5.5	1.1	3.9	2	0.4	3.4						
	CHVI (s)	55.5	11.1	39.5	14	2.8	23.7						
	ARTR (d)	8.2	1.6	5.8	1	0.2	1.7	114.5	22.9	87.3	23	4.6	52.3
	CELA	13.2	2.6	9.4	9	1.8	15.3						
	SIHY	5.4	1.1	3.8	2	0.4	3.4	1.5	0.3	1.1	1	0.2	2.3
	ORHY	3.2	0.6	2.3	2	0.4	3.4						
		140.5	28.0	100.0	59	11.8	100.1	131.1	26.2	99.9	44	8.8	100.0
MX 181	HIJA (d)	40.5	8.1	33.4	65	13.0	75.6	41.7	8.3	32.5	45	9.0	67.2
SS 10/13	EPNE (s)	41.3	8.3	34.1	9	1.8	10.5	38.0	7.6	29.6	9	1.8	13.4
	ATCO	1.8	0.4	1.5	2	0.4	2.3						
	CHVI	18.2	3.6	15.0	6	1.2	7.0	24.3	4.9	18.9	5	1.0	7.5
	SPAM	0.8	0.2	0.7	1	0.2	1.2						
	GRSP	14.1	2.8	11.6	2	0.4	2.3	15.5	3.1	12.1	3	0.6	4.5
	CELA	4.5	0.9	3.7	1	0.2	1.2						
	ATCA							3.8	0.8	3.0	2	0.4	3.0
	ARSP							1.5	0.3	1.2	1	0.2	1.5
	ORHY							3.5	0.7	2.7	2	0.4	3.0
		121.2	24.3	100.0	86	17.2	100.1	128.3	25.7	100.0	57	13.4	100.1
MX 181	ARNO (s)	29.1	5.8	20.1	10	2.0	13.7	22.3	4.5	20.9	11	2.2	16.7
SS 10/14	CHVI	19.6	3.9	13.5	6	1.2	8.2	30.1	6.0	28.2	14	2.8	21.2
	GUSA	2.0	0.4	1.4	1	0.2	1.4						
	CELA (d)	83.2	16.6	57.4	52	10.4	71.2	49.1	9.8	46.0	39	7.8	59.1
	ATCA	9.0	1.8	6.2	3	0.6	4.1						
	EPNE							3.6	0.7	3.3	1	0.2	1.5
	ORHY	2.0	0.4	1.4	1	0.2	1.4						
	SIHY							1.7	0.3	1.6	1	0.2	1.5
		144.9	29.0	100.0	73	14.6	100.0	106.8	21.3	100.0	66	13.2	100.0
MX 181	CHVI (s)	45.4	9.1	43.3	17	3.4	25.4	28.2	5.6	26.4	9	1.8	14.3
SS 10/15	CELA (d)	51.1	10.2	48.7	40	8.0	59.7	71.3	14.3	66.6	43	8.6	68.3
	SPAM	5.7	1.1	5.4	6	1.2	9.0	1.2	0.2	1.1	4	0.8	6.4
	MACA	0.7	0.1	0.7	2	0.4	3.0						
	ATCA							1.0	0.2	0.9	1	0.2	1.6
	SIHY	0.5	0.1	0.5	1	0.2	1.5	1.5	0.3	1.4	3	0.6	4.8
	ORHY	1.5	0.3	1.4	1	0.2	1.5	3.8	0.8	3.6	3	0.6	4.8
		104.9	21.0	100.0	67	13.4	100.0	107.0	21.4	100.0	63	12.6	100.2

TABLE E-10 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Transect 2 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	GUMI (s)	33.5	6.7	28.1	20	4.0	30.8						
SS 10/16	CELA (d)	82.2	16.4	69.0	37	7.4	56.9						
	HIJA	2.0	0.4	1.7	6	1.2	9.2						
	CRHY	1.4	0.3	1.2	2	0.4	3.1						
		119.1	23.8	100.0	65	13.0	100.0						
MX 181	HIJA	9.6	1.9	16.0	51	10.2	58.0	18.0	3.6	19.3	24	4.8	38.1
SS 10/17	CELA (d)	35.8	7.2	59.6	31	6.2	35.2	49.8	10.0	53.4	27	5.4	42.9
	GUMI	0.3	0.1	0.5	1	0.2	1.1						
	CHVI (s)	11.4	2.3	19.0	4	0.8	4.6	21.9	4.4	23.5	8	1.6	12.7
	ARSP	3.0	0.6	5.0	1	0.2	1.1	3.6	0.7	3.9	4	0.8	6.4
		60.1	12.1	100.1	88	17.6	100.0	93.3	18.7	100.1	63	12.6	100.1
MX 181	CELA (s)	39.2	7.8	34.2	16	3.2	29.6	25.9	5.2	18.7	15	3.0	20.8
SS 10/18	ARSP	1.5	0.3	1.3	1	0.2	1.9	0.8	0.2	0.6	3	0.6	4.2
	CHVI	45.3	9.1	39.6	13	2.6	24.1	43.9	8.8	31.6	6	1.2	8.3
	GRSP (d)	8.8	1.8	7.7	2	0.4	3.7	48.3	9.7	34.8	11	2.2	15.3
	ARTR	10.0	2.0	8.7	1	0.2	1.9						
	HIJA	8.9	1.8	7.8	20	4.0	37.0	18.2	3.6	13.1	34	6.8	47.2
	SIHY	0.8	0.2	0.7	1	0.2	1.9						
	CRHY							1.7	0.3	1.2	3	0.6	4.2
		114.5	23.0	100.0	54	10.8	100.1	138.8	27.8	100.0	72	14.4	100.0
MX 181	ARTR (d)	107.3	21.5	100.0	21	4.2	100.0	115.8	23.2	96.4	28	5.6	90.3
SS 10/19	EPNE (s)							3.8	0.8	3.2	2	0.4	6.5
	GRSP							0.5	0.1	0.4	1	0.2	3.2
		107.3	21.5	100.0	21	4.2	100.0	120.1	24.1	100.0	31	6.2	100.0
MX 181	CELA (d)	96.9	19.4	75.6	35	7.0	68.6	21.9	4.4	27.2	18	3.6	34.0
SS 10/20	SIHY	2.8	0.6	2.2	2	0.4	3.9	3.0	0.6	3.7	3	0.6	5.7
	ARTR (s)	14.9	3.0	11.6	4	0.8	7.8	28.0	5.6	34.7	10	2.0	18.9
	CRHY	?.1	0.4	1.6	3	0.6	5.9	5.8	1.2	7.2	6	1.2	11.3
	SPCR	3.3	0.7	2.6	3	0.6	5.9						
	GUMI	3.7	0.7	2.9	2	0.4	3.9	6.0	1.2	7.4	4	0.8	7.6
	CHVI	4.4	0.9	3.4	2	0.4	3.9	8.5	1.7	10.6	4	0.8	7.6
	HIJA							4.4	0.9	5.5	7	1.4	13.2
	ATCA							3.0	0.6	3.7	1	0.2	1.9
		128.1	25.7	100.0	51	10.2	99.9	80.6	16.2	100.0	53	10.6	100.2

TABLE E-10 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	ARNO (d)	196.8	39.4	75.1	35	7.0	52.2	98.1	19.6	59.0	36	7.2	45.5
SS 10/21	CELA	12.0	2.4	4.6	6	1.2	9.0						
	GUSA (s)	47.8	9.6	18.2	24	4.8	35.8						
	CHVI	1.5	0.3	0.6	1	0.2	1.5						
	EPNE	4.0	0.8	1.5	1	0.2	1.5	11.0	2.2	6.6	2	0.4	2.5
	ORHY							6.9	1.4	4.2	4	0.8	5.1
	GUMI							35.1	7.0	21.1	18	3.6	22.8
	HIJA							15.3	3.1	9.2	19	3.8	24.1
		262.1	52.5	100.0	67	13.4	100.0	166.4	33.3	100.1	79	15.8	100.0
MX 181	CHVI	4.2	0.8	3.1	4	0.8	13.8	1.5	0.3	1.2	1	0.2	2.9
SS 10/22	ARNO (d)	103.8	20.8	76.1	22	4.4	75.9	113.2	22.6	88.2	30	6.0	88.2
	EPNE (s)	28.4	5.7	20.8	3	0.6	10.3	12.5	2.5	9.7	2	0.4	5.9
	SIHY							1.2	0.2	0.9	1	0.2	2.9
		136.4	27.3	100.0	29	5.8	100.0	128.4	25.6	100.0	34	6.8	99.9
MX 181	ARTR (d)	77.9	15.6	77.6	24	4.8	70.6	104.6	20.9	69.7	26	5.2	60.5
SS 10/23	ORHY (s)	12.0	2.4	12.0	7	1.4	20.6	12.5	2.5	8.3	4	0.8	9.3
	CHVI	10.5	2.1	10.5	3	0.6	8.8	6.2	1.2	4.1	2	0.4	4.7
	EPNE							11.8	2.4	7.9	4	0.8	9.3
	SIHY							5.1	1.0	3.4	5	1.0	11.6
	GRSP							9.9	2.0	6.6	2	0.4	4.7
		100.4	20.1	100.1	34	6.8	100.0	150.1	30.0	100.0	43	8.6	100.0

TABLE E-11

TRANSECT RESULTS
DRY LAKE VALLEY
DTN AND CLUSTER ROAD SURVEY

Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Total Density (#/100 dm)	Rel. Den. (%)
DTN1	CHVI	2.4	0.5	1.6	1	0.2	2.3
	EPNE	82.2	16.4	56.1	9	1.8	20.5
	GRSP	16.9	3.4	11.5	4	0.8	9.1
	OPEC	14.4	2.9	9.8	3	0.6	6.8
	ARPU	1.4	0.3	1.0	1	0.2	2.3
	HIJA	27.6	5.5	18.8	25	5.0	56.8
	SPCO	1.7	0.3	1.2	1	0.2	2.3
		146.6	29.3	100.0	44	8.8	100.1
DTN2	ATCA	9.3	1.9	9.8	4	0.8	5.1
	CELA	80.1	16.0	84.3	66	13.2	84.6
	ORHY	5.6	1.1	5.9	8	1.6	10.3
		95.0	19.0	100.0	78	15.6	100.0
DTN3	ATCA	1.5	0.3	1.5	1	0.2	2.3
	CELA	4.5	0.9	4.4	2	0.4	4.7
	CHGR	65.6	13.1	64.5	19	3.8	44.2
	EPNE	8.4	1.7	8.3	1	0.2	2.3
	TEGI	9.6	1.9	9.4	3	0.6	7.0
	HIJA	5.1	1.0	5.0	12	2.4	27.9
	ORHY	7.0	1.4	6.9	5	1.0	11.6
		101.7	20.3	100.0	43	8.6	100.0
DTN4	ATCA	0.8	0.2	1.1	1	0.2	4.2
	ATCO	58.0	11.6	77.3	15	3.0	62.5
	CELA	13.6	2.7	18.1	6	1.2	25.0
	ORHY	2.6	0.5	3.5	2	0.4	8.3
		75.0	15.0	100.0	24	4.8	100.0
DTN5	ATCA	9.8	2.0	10.0	5	1.0	11.4
	ATCO	42.1	8.4	43.1	16	3.2	36.4
	CELA	45.7	9.1	46.8	23	4.6	52.3
		97.6	19.5	99.9	44	8.8	100.1

TABLE E-11 (Cont.)

Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Total Density (#/100 dm)	Rel. Den. (%)
DTN6	ATCA	11.1	2.2	12.7	5	1.0	13.5
	ATCO	32.1	6.4	36.7	11	2.2	29.7
	CELA	42.7	8.5	48.8	18	3.6	48.7
	ORHY	1.6	0.4	1.8	3	0.6	8.1
		87.5	17.5	100.0	37	7.4	100.0
DTN7	ARSP	23.7	4.7	22.7	17	3.4	36.2
	ATCA	8.1	1.6	7.8	6	1.2	12.8
	CELA	61.8	12.4	59.1	20	4.0	42.6
	CHGR	10.9	2.2	10.4	4	0.8	8.5
		104.5	20.9	100.0	47	9.4	100.1
Cluster Road 1	CELA	1.8	0.4	1.6	2	0.4	4.4
	CHGR	34.3	6.9	29.6	13	2.6	28.9
	GRSP	68.1	13.6	58.8	14	2.8	31.1
	HIJA	2.2	0.4	1.9	6	1.2	13.3
	ORHY	9.4	1.9	8.1	10	2.0	22.2
		115.8	23.2	100.0	45	9.0	99.9
Cluster Road 2	ARSP	7.6	1.5	5.7	3	0.6	5.7
	ATCO	50.4	10.1	37.9	18	3.6	34.0
	CELA	74.0	14.8	55.6	30	6.0	56.6
	SIHY	1.1	0.2	0.8	2	0.4	3.8
		133.1	26.6	100.0	53	10.6	100.1
Cluster Road 3	CELA	58.6	11.7	36.4	39	7.8	34.5
	ARSP	44.3	8.9	27.5	22	4.4	19.5
	CHVI	17.6	3.5	10.9	12	2.4	10.6
	GRSP	20.4	4.1	12.7	4	0.8	3.5
	HIJA	11.8	2.4	7.3	28	5.6	24.8
	ORHY	5.5	1.1	3.4	6	1.2	5.3
	SIHY	2.7	0.5	1.7	2	0.4	1.8
		160.9	32.2	99.9	113	22.6	100.0

TABLE E-12

TRANSECT RESULTS
DRY LAKE VALLEY
CLUSTER MAINTENANCE FACILITIES

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 CMF-1	CELA (s)	44.8	9.0	50.1	30	6.0	61.2	47.6	9.5	38.6	19	3.8	35.1
	CHGR (d)	21.9	4.9	24.5	11	2.2	22.5	74.3	14.9	60.2	34	6.8	63.0
	ARSP	22.8	4.6	25.5	8	1.6	16.3						
	ORHY							1.5	0.3	1.2	1	0.2	1.9
		89.5	17.9	100.1	49	9.8	100.0	123.4	24.7	100.0	54	10.8	100.0
MX 181 CMF-2	CELA (d)	64 5	12.9	76.2	37	7.4	77.1	40.1	8.0	53.2	28	5.6	34.1
	ORHY	0.5	0.1	0.6	1	0.2	2.1						
	ARSP (s)	19.6	3.9	23.2	10	2.0	20.8	25.4	5.1	33.7	23	4.6	28.0
	HIJA							8.0	1.6	10.6	27	5.4	32.9
	SPCR							0.7	0.1	0.9	2	0.4	2.4
	MA							0.3	0.1	0.4	1	0.2	1.2
	SP							0.9	0.2	1.2	1	0.2	1.2
		84.6	16.9	100.0	48	9.6	100.0	75.4	15.1	100.0	82	16.4	99.8
MX 181 CMF-3	GRSP (d)	57.3	11.5	38.8	23	4.6	32.9	133.5	26.7	80.4	33	6.6	55.9
	CHVI (s)	88.5	18.6	59.9	38	7.6	54.3	32.5	6.5	19.6	26	5.2	44.1
	ATCA	0.8	0.2	0.5	1	0.2	1.4						
	HIJA	1.2	0.2	0.8	8	1.6	11.4						
		147.8	30.5	100.0	70	14.0	100.0	166.0	33.2	100.0	59	11.8	100.0
MX 181 CMF-4	ATCO (d)	86.1	17.2	71.3	41	8.2	62.1	41.7	8.3	53.8	27	5.4	34.6
	ORHY	15.6	3.1	12.9	9	1.8	13.6	0.6	0.1	0.8	1	0.2	1.3
	ARSP	16.8	3.4	13.9	13	2.6	19.7	5.3	1.1	6.8	5	1.0	6.4
	SP	2.2	0.4	1.8	3	0.6	4.6						
	KOAM (s)							29.9	6.0	38.6	45	9.0	57.7
		120.7	24.1	99.9	66	13.2	100.0	77.5	15.5	100.0	78	15.6	100.0
MX 181 CMF-5	SPCO	6.3	1.3	6.8	11	2.2	13.9						
	CELA	0.1	0.0	0.1	1	0.2	1.3	2.0	0.4	2.0	2	0.4	1.4
	GUMI (d)	80.7	16.1	87.0	36	7.2	45.6						
	HIJA (s)	5.7	1.1	6.1	31	6.2	39.2	62.6	12.5	61.8	113	22.6	80.1
	GUSA							32.2	6.4	31.8	22	4.4	15.6
	SPCR							3.1	0.6	3.1	3	0.6	2.1
	SIHY							1.4	0.3	1.4	1	0.2	0.7
		92.8	18.5	100.0	79	15.8	100.0	101.3	20.2	100.1	141	28.2	99.9

TABLE E-12 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 CMF-6	HIJA (d)	30.7	6.1	28.0	39	7.8	67.2	21.7	4.3	25.2	51	10.2	76.1
	EPNE	27.3	5.5	24.9	5	1.0	8.6	35.8	7.2	41.6	7	1.4	10.5
	SIHY	0.3	0.1	0.3	2	0.4	3.5	1.3	0.3	1.5	1	0.2	1.5
	GRSP (s)	22.7	4.5	20.7	5	1.0	8.6	18.5	3.7	21.5	3	0.6	4.5
	OPEC	2.0	0.4	1.8	1	0.2	1.7						
	LYAN	7.8	1.6	7.1	2	0.4	3.5	1.5	0.3	1.7	1	0.2	1.5
	TEGL	18.9	3.8	17.2	4	0.8	6.9						
	ARSP							4.3	0.9	5.0	2	0.4	3.0
	ORHY							3.0	0.6	3.5	2	0.4	3.0
		109.7	22.0	100.0	58	11.6	100.0	86.1	17.3	100.0	60	13.4	100.0
MX 181 CMF-7	EPNE (s)	12.8	2.6	14.8	5	1.0	11.1	26.4	5.3	35.7	5	1.0	20.8
	CHVI (d)	38.1	7.6	43.9	12	2.4	26.7	2.4	0.5	3.3	1	0.2	4.2
	ORHY	11.2	2.2	12.9	14	2.8	31.1	7.0	1.4	9.5	3	0.6	12.5
	CELA	7.8	1.6	9.0	6	1.2	13.3	6.1	1.2	8.3	4	0.8	16.7
	TEGL	16.0	3.2	18.4	4	0.8	8.9	28.1	5.6	38.0	7	1.4	29.2
	HIJA	0.3	0.1	0.4	3	0.6	6.7						
	SIHY	0.6	0.1	0.7	1	0.2	2.2	2.9	0.6	3.9	3	0.6	12.5
	ATCA							1.0	0.2	1.4	1	0.2	4.2
		86.8	17.4	100.1	45	9.0	100.0	73.9	14.8	100.1	24	4.8	100.1
MX 181 CMF-8	HIJA (d)	46.7	9.3	37.7	99	19.8	58.2	29.1	5.8	28.3	67	13.4	59.8
	CELA (s)	39.8	8.0	32.2	37	7.4	21.8	15.2	3.0	14.8	13	2.6	11.6
	ARSP	20.7	4.1	16.7	19	3.8	11.2	9.1	1.8	8.9	8	1.6	7.1
	CHVI	14.1	2.8	11.4	13	2.6	7.7	17.4	3.5	16.9	17	3.4	15.2
	SPCR	0.7	0.1	0.6	1	0.2	0.6	1.5	0.3	1.5	1	0.2	0.9
	ARNO	1.8	0.4	1.5	1	0.2	0.6	22.6	4.5	22.0	5	1.0	4.5
	LYAN							7.9	1.6	7.7	1	0.2	0.9
		123.8	24.8	100.1	170	34.0	100.0	102.8	20.5	100.1	112	22.4	100.0
MX 181 CMF-9	CHGR (s)	64.5	12.9	40.6	14	2.8	46.7	16.7	3.3	10.2	3	0.6	7.1
	ARTR (d)	93.4	18.7	58.7	15	3.0	50.0	139.8	28.0	85.4	30	6.0	71.4
	ORHY	1.1	0.2	0.7	1	0.2	3.3	0.8	0.2	0.5	1	0.2	2.4
	HIJA							1.4	0.3	0.9	6	1.2	14.3
	GRSP							5.1	1.0	3.1	2	0.4	4.8
		159.0	31.8	100.0	30	6.0	100.0	163.8	32.8	100.1	42	8.4	100.0

TABLE E-12 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	EPNE	17.1	3.4	12.1	4	0.8	12.1	7.5	1.5	5.5	2	0.4	3.6
CMF-10	CHVI (s)	17.9	3.6	12.7	3	0.6	9.1	16.9	3.4	12.4	6	1.2	10.9
	CELA	5.8	1.2	4.1	4	0.8	12.1	4.1	0.8	3.0	9	1.8	16.4
	GRSP (d)	94.3	18.9	66.8	16	3.2	48.5	45.5	9.1	33.5	11	2.2	20.0
	ARSP	3.3	0.7	2.3	4	0.8	12.1						
	ASLE	0.2	0.0	0.1	1	0.2	3.0						
	TEGL	2.5	0.5	1.8	1	0.2	3.0	19.5	3.9	14.3	4	0.8	7.3
	HIJA							3.4	0.7	2.5	14	2.8	25.5
	ATCA							26.3	5.3	19.4	6	1.2	10.9
	SIHY							0.1	0.0	0.1	1	0.2	1.8
	LYAN							12.6	2.5	9.3	2	0.4	3.6
		141.1	28.3	99.9	33	6.6	99.9	135.9	27.2	100.0	55	11.0	100.0

TABLE E-13

TRANSECT RESULTS
DRY LAKE VALLEY
REMOTE SURVEILLANCE SITES

Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 RSS-1	CELA (d)	37.7	7.5	38.4	15	3.0	45.5
	ARSP (s)	36.7	7.3	37.3	8	1.6	24.2
	CHVI	9.3	1.9	9.5	3	0.6	9.1
	ATCA	13.2	2.6	13.4	5	1.0	15.2
	ORHY	1.4	0.3	1.4	2	0.4	6.1
		98.3	19.7	100.0	33	6.6	100.1
MX 181 RSS-2	CHVI (s)	39.3	7.9	33.2	19	3.8	40.4
	CELA	10.2	2.0	8.6	6	1.2	12.8
	HIJA	2.9	0.6	2.5	9	1.8	19.2
	GRSP (d)	61.8	12.4	52.2	12	2.4	25.5
	LYAN	4.3	0.9	3.6	1	0.2	2.1
		118.5	23.8	100.1	47	9.4	100.0
MX 181 RSS-3	CELA (d)	68.3	13.7	94.7	53	10.6	94.6
	ATCA (s)	3.0	0.6	4.2	2	0.4	3.6
	ORHY	0.8	0.2	1.1	1	0.2	1.8
		72.1	14.5	100.0	56	11.2	100.0
MX 181 RSS-4	ATCO (d)	77.9	15.6	77.0	37	7.4	54.4
	ORHY	10.1	2.0	10.0	11	2.2	16.2
	CELA	1.5	0.3	1.5	3	0.6	4.4
	ARSP (s)	11.1	2.2	11.0	15	3.0	22.1
	SIHY	0.6	0.1	0.6	2	0.4	2.9
		101.2	20.2	100.1	68	13.6	100.0
MX 181 RSS-5	CELA	20.9	4.2	16.0	16	3.2	31.4
	ARSP	16.6	3.3	12.7	10	2.0	19.6
	GUSA	1.2	0.2	0.9	1	0.2	2.0
	ATCA (s)	34.9	7.0	26.7	13	2.6	25.5
	GRSP (d)	48.4	9.7	37.1	8	1.6	15.7
	CHVI	7.5	1.5	5.7	2	0.4	3.9
	ORHY	1.0	0.2	0.8	1	0.2	2.0
		130.5	26.1	99.9	51	10.2	100.1

TABLE E-14

TRANSECT RESULTS
DRY LAKE SHELTER SITES
RESITINGS

		Transect 1						Transect 2					
Sample Unit #	Plant Species	*Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS-1/3	CHVI	118.0	23.6	73.6	41	8.2	63.1	116.4	23.3	77.1	49	9.8	62.0
	GRSP	21.2	4.2	13.2	5	1.0	7.7	15.8	3.2	10.5	4	0.8	5.1
	CELA	12.7	2.5	7.9	10	2.0	15.4	14.7	2.9	9.7	14	2.8	17.7
	HIJA	1.8	0.4	1.1	4	0.8	6.2	2.0	0.4	1.3	9	1.8	11.4
	OPER	1.8	0.4	1.1	1	0.2	1.5						
	ARSP	3.2	0.6	2.0	2	0.4	3.1						
	ORHY	1.6	0.3	1.0	2	0.4	3.1	2.0	0.4	1.3	3	0.6	3.8
		160.3	32.0	99.9	65	13.0	100.1	150.9	30.2	99.9	79	15.8	100.0
MX 181 SS-2/6	CELA	160.5	32.1	97.8	73	14.6	90.1	172.8	34.6	98.8	74	14.8	91.4
	ARSP	1.1	0.2	0.7	1	0.2	1.2						
	HIJA	2.5	0.5	1.5	7	1.4	8.6	0.7	0.1	0.4	4	0.8	4.9
	ORHY							1.4	0.3	0.8	3	0.6	3.7
		164.1	32.8	100.0	81	16.2	99.9	174.9	35.0	100.0	81	16.2	100.0
MX 181 SS-2/9	CELA	89.9	18.0	80.6	43	8.6	51.2	102.7	20.5	88.2	57	11.4	73.1
	HIJA	7.3	1.3	6.5	25	5.0	29.8	5.4	0.2	4.6	16	3.2	20.5
	SPCO	3.4	0.7	3.1	11	2.2	13.1						
	ARSP	7.1	1.4	6.4	4	0.8	4.8	6.6	1.3	5.7	2	0.4	2.6
	CHVI	3.9	0.8	3.5	1	0.2	1.2	1.1	0.2	0.9	1	0.2	1.3
	ORHY							0.7	0.1	0.6	2	0.4	2.6
		111.6	22.2	100.1	84	16.8	100.1	116.5	22.3	100.0	78	15.6	100.1
MX 181 SS-2/22	HIJA	4.4	0.9	3.8	12	2.4	23.1	7.3	1.5	6.0	9	1.8	21.4
	CHVI	53.9	10.8	46.0	17	3.4	32.7	78.8	15.8	65.0	23	4.6	54.8
	GRSP	23.0	4.6	19.6	7	1.4	13.5	8.9	1.8	7.3	3	0.6	7.1
	SIHY	1.0	0.2	0.9	1	0.2	1.9						
	CELA	16.0	3.2	13.7	12	2.4	23.1	3.9	0.8	3.2	3	0.6	7.1
	TEGL	15.7	3.1	13.4	2	0.4	3.8						
	EPNE	3.1	0.6	2.6	1	0.2	1.9	6.0	1.2	5.0	1	0.2	2.4
	LYAN							16.3	3.3	13.5	3	0.6	7.1
		117.1	23.4	100.0	52	10.4	100.0	121.2	24.4	100.0	42	8.4	99.9

TABLE E-14 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Transect 2 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	HIJA	11.1	2.2	10.7	29	5.8	37.7	8.0	1.6	8.4	19	3.8	33.9
SS 2/23	CHVI	10.3	2.1	10.0	7	1.4	9.1	8.4	1.7	8.9	6	1.2	10.7
	LYAN							19.5	3.9	20.6	4	0.8	7.1
	GRSP	40.1	8.0	38.8	11	2.2	14.3	34.6	6.9	36.5	5	1.0	8.9
	CELA	32.1	6.4	31.0	25	5.0	32.5	13.2	2.6	13.9	15	3.0	26.8
	ARSP	6.8	1.0	6.6	4	0.8	5.2	3.9	0.8	4.1	3	0.6	5.4
	SIHY							0.5	0.1	0.5	1	0.2	1.8
	EPNE	3.0	0.6	2.9	1	0.2	1.3	6.8	1.4	7.2	3	0.6	5.4
		103.4	20.3	100.0	77	15.4	100.1	94.9	19.0	100.1	56	11.2	100.0
MX 181	CHVI	48.5	9.7	32.7	13	2.6	37.1	43.2	8.6	39.9	17	3.4	46.0
SS 3/1A	ARTR	66.6	13.3	44.9	16	3.2	45.7	26.9	5.4	24.9	8	1.6	21.6
	EPNE	17.8	3.5	11.8	5	1.0	14.3	26.7	5.3	24.7	7	1.4	18.9
	TEGL							5.6	1.1	5.2	2	0.4	5.4
	YUBA							5.3	1.1	4.9	2	0.4	5.4
	GRSP							0.5	0.1	0.5	1	0.2	2.7
	SIHY	15.7	3.2	10.6	1	0.2	2.9						
		148.6	29.7	100.0	35	7.0	100.0	108.2	21.6	100.1	37	7.4	100.0
MX 181	CHVI	35.6	7.0	23.9	8	1.6	23.5	33.5	6.7	19.6	11	2.2	31.4
SS 3/5A	GRSP	47.0	9.4	32.1	8	1.6	23.5						
	HIJA	0.5	0.1	0.3	1	0.2	2.9						
	ARTR	59.4	11.9	40.6	15	3.0	44.1	133.6	26.7	78.3	23	4.6	65.7
	EPNE	3.8	0.8	2.6	1	0.2	2.9						
	SIHY	0.8	0.2	0.5	1	0.2	2.9						
	TEGL							3.5	0.7	2.1	1	0.2	2.9
		146.6	29.4	100.0	34	6.8	99.8	170.6	34.1	100.0	35	7.0	100.0
MX 181	ARTR	129.3	25.9	83.2	42	8.4	80.8	82.3	16.5	59.3	18	3.6	54.5
SS 3/14	EPNE	15.5	3.1	10.0	4	0.8	7.7	25.4	5.1	18.3	5	1.0	15.2
	CHVI	4.5	0.9	2.9	3	0.6	5.8	26.5	5.3	19.1	6	1.2	18.2
	ARSP	0.5	0.1	0.3	1	0.2	1.9						
	GRSP	5.6	1.1	3.6	2	0.4	3.9	1.5	0.3	1.1	1	0.2	3.0
	SIHY							3.2	0.6	2.3	3	0.6	9.1
		155.4	31.1	100.0	52	10.4	100.1	138.9	27.8	100.1	33	6.6	100.0

TABLE E-14 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 4/1	ATCO	51.1	10.2	66.9	33	6.6	64.7	30.7	6.1	82.1	21	4.2	63.6
	KOAM	11.2	2.2	14.7	7	1.4	13.7						
	CELA	10.6	2.1	13.9	8	1.6	15.7	3.1	0.6	8.3	3	0.6	9.1
	ARSP	3.0	0.6	3.9	2	0.4	3.9	2.6	0.5	7.0	3	0.6	9.1
	SIHY	0.4	0.1	0.5	1	0.2	2.0						
	ATCA							8.3	0.2	2.7	6	1.2	18.2
		76.3	15.2	99.9	51	10.2	100.0	44.7	7.4	100.1	33	6.6	100.0
MX 181 SS 4/2	ATCA	11.6	2.3	11.3	3	0.6	9.1	12.0	2.4	31.0	2	0.4	11.8
	KOAM	76.9	15.4	74.9	27	5.4	81.8	22.4	4.5	57.9	6	1.2	35.3
	ATCO	14.1	2.8	13.7	3	0.6	9.1	4.3	0.9	11.1	9	1.8	52.9
		102.6	20.5	99.9	33	6.6	100.0	38.7	7.8	100.0	17	3.4	100.0
MX 181 SS 4/3	ATCO	54.3	10.8	99.5	34	6.8	97.1	56.5	11.3	100.0	31	6.2	100.0
	KOAM	0.3	0.1	0.6	1	0.2	2.9						
		54.6	10.9	100.1	35	7.0	100.0	56.5	11.3	100.0	31	6.2	100.0
MX 181 SS 4/9	ARSP	30.4	6.1	21.9	30	6.0	40.0	23.2	4.6	22.6	21	4.2	29.2
	CELA	15.2	3.0	10.9	10	2.0	13.3	14.5	2.9	14.1	11	2.2	15.3
	ATCO	92.5	18.5	66.5	34	6.8	45.3	65.1	13.0	63.3	40	8.0	55.6
	ORHY	1.0	0.2	0.7	1	0.2	1.3						
		139.1	27.8	100.0	75	15.0	99.9	102.8	20.5	100.0	72	14.4	100.1
MX 181 SS 4/22	CHGR	55.2	11.0	48.8	20	4.0	29.0	59.0	11.8	64.8	23	4.6	42.6
	TESP	2.0	0.4	1.8	3	0.6	4.3						
	CELA	7.3	1.5	6.4	3	0.6	4.3	7.5	1.5	8.2	8	1.6	14.8
	ORHY	1.8	0.4	1.6	3	0.6	4.3						
	ATCA	7.1	1.4	6.3	2	0.4	2.9	3.7	0.7	4.1	1	0.2	1.9
	ATCO	22.5	4.5	19.9	8	1.6	11.6	8.8	1.8	9.7	5	1.0	9.3
	HIJA	16.2	3.2	14.3	29	5.8	42.0						
	ARSP	1.1	0.2	1.0	1	0.2	1.5	5.7	1.1	6.3	5	1.0	9.3
	KOAM							2.5	0.5	2.7	6	1.2	11.1
	SIHY							1.8	0.4	2.0	4	0.8	7.4
	ARTR							2.1	0.4	2.3	2	0.4	3.7
		113.2	22.6	100.1	69	13.8	99.9	91.1	18.2	100.1	54	10.8	100.1

TABLE E-14 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Transect 2 Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	CELA	101.5	20.3	100.0	99	19.8	100.0	107.8	21.6	99.6	110	22.0	99.1
SS 5/5	ATCA							0.4	0.1	0.4	1	0.2	0.9
		101.5	20.3	100.0	99	19.8	100.0	108.2	21.7	100.0	111	22.2	100.0
SS 5/9		SAME AS ORIGINAL						SAME AS ORIGINAL					
SS 5/12		SAME AS ORIGINAL						SAME AS ORIGINAL					
SS 5/18		SAME AS ORIGINAL						SAME AS ORIGINAL					
MX 181	ARNO	91.2	18.1	61.6	23	4.6	34.8						
SS 5/19	EPNE	16.5	3.3	11.1	5	1.0	7.6	19.8	4.0	15.4	4	0.8	4.2
	CELA	3.5	0.7	2.4	4	0.8	6.1	8.3	1.7	6.4	13	2.6	13.7
	ORHY	1.5	0.3	1.0	1	0.2	1.5						
	HIJA	22.4	4.5	15.1	29	5.8	43.9	35.9	7.2	28.0	65	13.0	68.4
	TEGL	9.9	2.0	6.7	2	0.4	3.0	17.3	3.5	13.4	2	0.4	2.1
	GUSA	3.0	0.6	2.0	2	0.4	3.0						
	ARTR							1.3	6.3	24.5	1	0.2	1.1
	SPAM							1.3	0.3	1.0	2	0.4	2.1
	CHVI							2.5	0.5	2.0	2	0.4	2.1
	SPCR							12.2	2.4	9.3	6	1.2	6.3
		148.0	29.5	99.9	66	13.2	99.9	98.6	25.9	100.0	95	19.0	100.0
MX 181	ARTR	35.8	7.2	24.5	8	1.6	21.6	81.4	16.3	73.5	17	3.4	77.3
SS 6/1	TEAX	4.7	0.9	3.2	1	0.2	2.7						
Option	CHVI	43.1	8.6	29.5	16	3.2	43.2						
1 (east)	TEGL	38.5	7.7	26.4	7	1.4	18.9	8.5	1.7	7.7	1	0.2	4.6
	GRSP	14.6	2.9	10.0	4	0.8	10.8						
	EPNE	9.3	1.9	6.4	1	0.2	2.7	20.9	4.2	18.9	4	0.8	18.2
		146.0	29.2	100.0	37	7.4	99.9	110.8	22.2	100.1	22	4.4	100.1
MX 181	LYAN	4.1	0.8	5.7	1	0.2	5.9						
SS 6/1	GUMI	19.8	4.0	27.4	7	1.4	41.2						
Option	ARTR	26.1	5.2	36.1	4	0.8	23.5	16.8	3.4	18.3	6	1.2	15.8
2 (west)	EPNE	5.8	1.2	8.0	1	0.2	5.9						
	AMER	16.6	3.3	22.9	4	0.8	23.5						
	CHVI							64.4	12.9	70.3	20	4.0	52.7
	HIJA							3.9	0.8	4.3	10	2.0	26.3
	GRSP							6.5	1.3	7.1	2	0.4	5.3
		72.4	14.5	100.1	17	3.4	100.0	91.6	18.4	100.0	38	7.6	100.1

TABLE E-14 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181	GRSP	27.4	5.5	22.4	5	1.0	15.2						
SS 6/1	HIJA	3.1	0.6	2.5	5	1.0	15.2						
(3rd	ARTR	2.2	0.5	1.8	1	0.2	3.0	92.7	18.5	63.1	18	3.6	60.0
Option)	EPNE	18.0	3.6	14.7	4	0.8	12.1	2.0	0.4	1.4	1	0.2	3.3
	CHVI	47.8	9.6	39.0	14	2.8	42.4	33.5	6.7	22.8	8	1.6	26.7
	TEGL	23.9	4.8	19.5	4	0.8	12.1	18.8	3.8	12.8	3	0.6	10.0
		122.4	24.6	99.9	33	6.6	100.0	147.0	30.1	100.1	30	6.0	100.0
MX 181	TEGL	58.7	11.7	37.8	13	2.6	22.8	54.9	11.0	34.1	8	1.6	22.9
SS 6/2	EPNE	28.5	5.7	18.3	7	1.4	12.3	29.2	5.8	18.1	5	1.0	14.3
	CHVI	14.7	3.0	9.5	4	0.8	7.0	10.9	2.2	6.8	2	0.4	5.7
	GRSP	8.4	1.7	5.4	3	0.6	5.3	33.3	6.7	20.7	9	1.8	25.7
	ARTR	11.4	2.3	7.4	2	0.4	3.5	24.1	4.8	15.0	3	0.6	8.6
	SIHY	8.4	1.7	5.4	8	1.6	14.0	1.5	0.3	0.9	1	0.2	2.9
	HIJA	20.1	4.0	12.9	19	3.8	33.3	7.1	1.4	4.4	7	1.4	20.0
	LYAN	5.1	1.0	3.3	1	0.2	1.8						
		155.3	31.1	100.0	57	11.4	100.0	161.0	32.2	100.0	35	7.0	100.1
MX 181	CHGR	34.4	6.9	20.0	9	1.8	34.0	6.4	1.3	6.0	2	0.4	5.1
SS 6/14	ATCA	8.5	1.7	8.9	4	0.8	8.4	3.9	0.8	3.7	1	0.2	2.6
	TEGL	1.2	0.2	2.2	1	0.2	1.2						
	ORHY	3.9	0.8	8.9	4	0.8	3.9						
	GRSP	13.0	2.6	11.1	5	1.0	12.9	31.0	6.2	29.1	10	2.0	25.6
	LYAN	5.2	1.0	6.7	3	0.6	5.1	27.4	5.5	25.7	5	1.0	12.8
	ARSP	2.5	0.5	2.2	1	0.2	2.5	1.8	0.4	1.7	1	0.2	2.6
	SIHY	0.3	0.1	4.4	2	0.4	0.3						
	EPNE	25.4	5.1	8.9	4	0.8	25.1	33.6	6.7	31.5	10	2.0	25.6
	HIJA	6.7	1.3	26.7	12	2.4	6.6	2.5	0.5	2.3	10	2.0	25.6
		101.1	20.2	100.0	45	9.0	100.0	106.6	21.4	100.0	39	7.8	99.9
MX 181	EPNE	41.6	8.3	36.9	6	1.2	12.2	42.5	8.5	17.7	6	1.2	45.8
SS 6/18	CHVI	14.7	2.9	13.0	5	1.0	10.2	14.1	2.8	14.7	5	1.0	15.2
	TEGL	23.4	4.7	20.7	4	0.8	8.2	30.4	6.1	26.5	9	1.8	32.8
	HIJA	23.9	4.8	21.2	28	5.6	57.1	1.4	0.3	20.6	7	1.4	1.5
	SIHY	3.1	0.6	2.8	3	0.6	6.1	0.3	0.1	8.8	3	0.6	0.3
	LYAN	1.4	0.3	1.2	1	0.2	2.0	2.0	0.4	5.9	2	0.4	2.2
	GRSP	4.8	1.0	4.3	2	0.4	4.1	0.6	0.1	2.9	1	0.2	0.7
	ARSP							1.5	0.3	2.9	1	0.2	1.6
		112.9	22.6	100.1	49	9.8	99.9	92.8	18.6	100.0	34	6.8	100.1

TABLE E-14 (Cont.)

		Transect 1						Transect 2					
Sample Unit #	Plant Species	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)	Total Cover (dm)	Total Cover (%)	Rel. Cover (%)	# of Plants	Density (#/100 dm)	Rel. Den. (%)
MX 181 SS 8/18	GUSA	65.8	13.2	51.8	35	7.0	53.8						
	HIJA	0.5	0.1	0.4	1	0.2	1.5						
	EPNE	20.3	4.1	16.0	3	0.6	4.6						
	SIHY	1.3	0.3	1.0	5	1.0	7.7						
	ORHY	8.1	1.6	6.4	9	1.8	13.8						
	CHVI	21.6	4.3	17.0	8	1.6	12.3						
	STCO	1.0	0.2	0.8	1	0.2	1.5						
	ARTR	4.3	0.9	3.4	2	0.4	3.1	24.4	4.9	19.8	12	2.4	44.4
	TEGL	4.1	0.8	3.2	1	0.2	1.5						
	CHNA							7.6	1.5	6.2	1	0.2	3.7
	COME							77.2	15.4	62.8	9	1.8	33.3
	PRVI							9.4	1.9	7.6	3	0.6	11.1
	VIMU							4.3	0.9	3.5	2	0.4	7.4
		127.0	25.5	100.0	65	13.0	99.8	122.9	24.6	99.9	27	5.4	99.9
MX 181 SS 8/19	ARTR	76.8	15.4	54.3	24	4.8	33.3	178.3	35.7	86.7	38	7.6	58.5
	ORHY	11.8	2.4	8.3	10	2.0	13.9	4.5	0.9	2.2	5	1.0	7.7
	EPNE	14.1	2.8	10.0	5	1.0	6.9	3.1	0.6	1.5	1	0.2	1.5
	SIHY	23.2	4.6	16.4	23	4.6	31.9						
	CHVI	10.8	2.2	7.6	3	0.6	4.2						
	HIJA	4.8	1.0	3.4	7	1.4	9.7	11.9	2.4	5.8	17	3.4	26.2
	GUSA							5.1	1.0	2.5	2	0.4	3.1
	GRSP							2.3	0.5	1.1	1	0.2	1.5
	COVI							0.4	0.1	0.2	1	0.2	1.5
		141.5	28.4	100.0	72	14.4	99.9	205.6	41.2	100.0	65	13.0	100.0
MX 181 SS 8/21	ARTR	88.3	17.7	71.4	18	3.6	62.1						
	EPNE	12.5	2.5	10.1	3	0.6	10.3						
	CHVI	19.8	4.0	16.0	7	1.4	24.1						
	LYAN	3.1	0.6	2.5	1	0.2	3.5						
		123.7	24.8	100.0	29	5.8	100.0						
MX 181 SS 8/22	ARTR	134.8	27.0	78.6	33	6.6	73.3	118.7	23.7	71.4	19	3.8	70.4
	GRSP	11.1	2.2	6.5	4	0.8	8.9	4.6	0.9	2.8	1	0.2	3.7
	EPNE	21.2	4.2	12.4	4	0.8	8.9	14.6	2.9	8.8	2	0.4	7.4
	ORHY	0.8	0.2	0.5	2	0.4	4.4						
	LYAN	3.6	0.7	2.1	2	0.4	4.4						
	ATCA							20.9	4.2	12.6	1	0.2	3.7
	HIJA							0.4	0.1	0.2	1	0.2	3.7
	CHVI							7.1	1.4	4.3	3	0.6	11.1
		171.5	34.3	100.1	45	9.0	99.9	166.3	33.2	100.1	27	5.4	100.0

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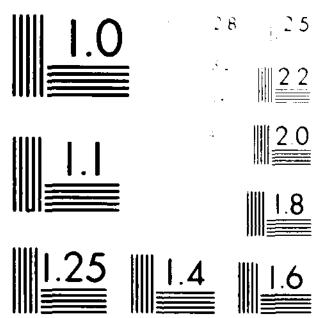
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TABLE E-14 (Cont.)

Sample Unit #	Plant Species	Transect 1 Total Cover (dm)	Transect 1 Total Cover (%)	Transect 1 Rel. Cover (%)	Transect 1 # of Plants	Transect 1 Density (#/100 dm)	Transect 1 Rel. Den. (%)	Transect 2 Total Cover (dm)	Transect 2 Total Cover (%)	Transect 2 Rel. Cover (%)	Transect 2 # of Plants	Transect 2 Density (#/100 dm)	Transect 2 Rel. Den. (%)
SS 9/23		SAME AS ORIGINAL						SAME AS ORIGINAL					
SS 10/12		SAME AS ORIGINAL						SAME AS ORIGINAL					
MX 181 SS 10/16	CELA	119.2	23.8	87.1	66	13.2	76.7	12.5	2.5	8.3	8	1.6	12.1
	ORHY	3.1	0.6	2.3	4	0.8	4.7						
	HIJA	3.3	0.7	2.4	9	1.8	10.5						
	GUSA	10.3	2.1	7.5	6	1.2	7.0	77.4	15.5	51.4	40	8.0	60.6
	CHVI	1.0	0.2	0.7	1	0.2	1.2	21.9	4.4	14.6	10	2.0	15.2
	ATCA							29.5	5.9	19.6	3	0.6	4.6
	ARSP							0.1	0.0	0.1	1	0.2	1.5
	EPNE							1.7	0.3	1.1	1	0.2	1.5
	GRSP							6.3	1.3	4.2	1	0.2	1.5
	SIHY							1.1	0.2	0.7	2	0.4	3.0
		136.9	27.4	100.0	86	17.2	100.1	150.5	30.1	100.0	66	13.2	100.0
MX 181 SS 5/20	CHVI							21.1	4.2	27.7	15	3.0	28.9
	HIJA							3.1	0.6	4.0	11	2.2	21.2
	ARTR							14.5	2.9	19.0	3	0.6	5.8
	ARPU							5.3	1.1	7.0	4	0.8	7.7
	SIHY	2.8	0.6	1.8	1	0.2	2.6	3.3	0.7	4.3	4	0.8	7.7
	SPCR							0.8	0.2	1.0	1	0.2	1.9
	TEGL							1.3	0.3	1.6	1	0.2	1.9
	ARNO	141.7	28.4	88.9	32	6.4	84.2	48.5	5.4	35.3	13	2.6	25.0
	ATCA	3.6	0.7	2.2	1	0.2	2.6						
	ORHY	6.1	1.2	3.8	3	0.6	7.9						
	EPNE	5.3	1.1	3.3	1	0.2	2.6						
		159.4	32.0	100.0	38	7.6	99.9	97.9	15.4	99.9	52	10.4	100.1

APPENDIX F

LOCATION DESCRIPTIONS OF DRY LAKE SURVEY SITES

TABLE F-1

Shelter Summary Table
DRY LAKE VALLEY

Cluster 1

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	Map References U.S.G.S.
MX-181-1/1	9/30/80	T4S, R63E, NW 1/4 Sec 12	#33	Pahroc Summit Pass
MX-181-1/2	9/30/80	T4S, R63E, NE 1/4 and NW 1/4 Sec. 2	#33	Pahroc Spring
MX-181-1/3	9/30/80	T4S, R64E, NW 1/4 Sec. 7	#34	Pahroc Spring SE
MX-181-1/3A*	11/20/80	T4S, R64E, NW 1/4 Sec. 7	#34	Pahroc Spring SE
MX-181-1/4	9/30/80	T4S, R64E, NW 1/4 Sec. 6	#34	Pahroc Spring NE
MX-181-1/5	9/30/80	T3S, R63E, SW 1/4 Sec. 36	#33	Pahroc Spring NE
MX-181-1/6	9/30/80	T4S, R64E, NW 1/4 Sec. 5	#34	Pahroc Spring NE
MX-181-1/7	10/03/80	T3S, R64E, NE 1/4 Sec. 32	#34	Pahroc Spring NE
MX-181-1/8	9/30/80	T3S, R64E, NW 1/4 Sec. 29	#34	Pahroc Spring NE
MX-181-1/9	10/03/80	T3S, R63E, SE 1/4 Sec. 13	#30	Pahroc Spring NE
MX-181-1/10	10/01/80	T3S, R64E, NE 1/4 and SE 1/4 Sec. 20	#31	Pahroc Spring NE
MX-181-1/11	10/01/80	T3S, R64E, SE 1/4 Sec. 18 SW 1/4 Sec. 17	#31	Pahroc Spring NE
MX-181-1/12	10/01/80	T3S, R64E, NE 1/4 and NW 1/4 Sec. 21	#31	Pahroc Spring NE
MX-181-1/13	10/01/80	T3S, R64E, SW 1/4 Sec. 8	#31	Pahroc Spring NE
MX-181-1/14	10/02/80	T3S, R64E, NE 1/4 and SE 1/4 Sec. 16	#31	Pahroc Spring NE
MX-181-1/15	10/02/80	T3S, R64E, SW 1/4 Sec. 9	#31	Pahroc Spring NE
MX-181-1/16	10/02/80	T3S, R64E, SE 1/4 Sec. 4	#31	Pahroc Spring NE
MX-181-1/17	10/01/80	T3S, R64E, NW 1/4 Sec. 4 T2S, R64E, SW 1/4 Sec. 33	#31 & #28	Pahroc Spring NE
MX-181-1/18	10/02/80	T3S, R64E, NW 1/4 Sec. 5	#31	Pahroc Spring NE
MX-181-1/19	10/02/80	T2S, R64E, NE 1/4 and NW 1/4 Sec. 31	#28	Pahroc Spring NE
MX-181-1/20	10/03/80	T2S, R64E, NE 1/4 Sec. 30 NW 1/4 Sec. 29	#28	Pahroc Spring NE
MX-181-1/21	10/03/80	T2S, R64E, NE 1/4 Sec. 29 NW 1/4 Sec. 28		Deadman Spring SE
MX-181-1/22	10/03/80	T2S, R64E, SW 1/4 Sec. 19	#28	Deadman Spring SE
MX-181-1/23	10/03/80	T2S, R64E, SE 1/4 Sec. 17	#28	Deadman Spring SE

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TABLE F-2

Shelter Summary Table

DRY LAKE VALLEY

Cluster 2

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	Map References U.S.G.S.
MX-181-2/1	10/01/80	T4S, R64E, SE 1/4 Sec 5 SW 1/4 Sec. 4, NW 1/4 Sec. 8, NW 1/4 Sec. 9	#34	Pahroc Spring SE
MX-181-2/2	10/01/80	T4S, R64E, SW 1/4 Sec. 3, SE 1/4 Sec. 4	#34	Pahroc Spring SE and NE
MX-181-2/3	10/01/80	T3S, R64E, SW 1/4 Sec. 34	#34	Pahroc Spring NE
MX-181-2/4	10/01/80	T3S, R64E, NW 1/4 Sec. 33	#34	Pahroc Spring NE
MX-181-2/5	10/02/80	T3S, R64E, SW 1/4 Sec. 35	#35	Pahroc Spring NE
MX-181-2/6	10/01/80	T3S, R64E, NW 1/4 Sec. 27	#34	Pahroc Spring NE
MX-181-2/6A*	11/20/80	T3S, R64E, NW 1/4 Sec. 27	#34	Pahroc Spring NE
MX-181-2/7	10/02/80	T3S, R64E, SW 1/4 Sec. 26	#35	Pahroc Spring NE
MX-181-2/8	10/03/80	T3S, R64E, NW 1/4 Sec. 26	#35	Pahroc Spring NE
MX-181-2/9	10/02/80	T3S, R64E, NW 1/4 and NE 1/4 Sec. 23	#32	Pahroc Spring NE
MX-181-2/9A*	11/20/80	T3S, R64E, NW 1/4 and NE 1/4 Sec. 23	#32	Pahroc Spring NE
MX-181-2/10	10/14/80	T3S, R64E, NE 1/4 Sec. 15	#31	Pahroc Spring NE
MX-181-2/11	10/03/80	T3S, R64E, NW 1/4 Sec. 24 SW 1/4 Sec. 13	#32	Pahroc Spring NE
MX-181-2/12	10/03/80	T3S, R64E, NW 1/4 and SW 1/4 Sec. 11	#32	Pahroc Spring NE
MX-181-2/13	10/02/80	T3S, R64E, NW 1/4 Sec. 12	#32	Pahroc Spring NE
MX-181-2/14	10/03/80	T3S, R64E, NW 1/4 Sec. 1	#32	Pahroc Spring NE
MX-181-2/15	10/04/80	T2S, R64E, SE 1/4 Sec. 36	#29	Pahroc Spring NE
MX-181-2/16	10/14/80	T2S, R64E, SW 1/4 Sec. 25	#29	Pahroc Spring NE
MX-181-2/17	10/14/80	T2S, R64E, NE 1/4 Sec. 26, SE 1/4 Sec. 23	#29	Deadman Spring SE
MX-181-2/18	10/14/80	T2S, R65E, SW 1/4 Sec. 30	#29	Caliente NW
MX-181-2/19	10/14/80	T2S, R65E, SE 1/4 Sec. 19	#29	The Bluffs
MX-181-2/20	10/14/80	T2S, R64E, SE 1/4 Sec. 13, NE 1/4 Sec. 24, T2S, R65E, NW 1/4 Sec. 19, SW 1/4 Sec. 18	#29	Dead Man Spring SE and The Bluffs
MX-181-2/21	10/14/80	T2S, R65E, NW 1/4 Sec. 18	#29	The Bluffs
MX-181-2/22	10/15/80	T2S, R65E, NW 1/4 Sec. 17, SW 1/4 Sec. 8	#29 & #25	The Bluffs
MX-181-2/22A*	11/19/80	T2S, R65E, SW 1/4 and SE 1/4 Sec. 8	#25	The Bluffs
MX-181-2/23	10/15/80	T2S, R65E, NW 1/4 and SW 1/4 Sec. 16	#39	The Bluffs
MX-181-2/23A*	11/19/80	T2S, R65E, NW 1/4 Sec. 16	#39	The Bluffs

TABLE F-3

Shelter Summary Table

DRY LAKE VALLEY

Cluster 3

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	Map References U.S.G.S.
MX-181-3/1		T3S, R63E, SW 1/4 Sec.14	#30	Pahroc Spring
MX-181-3/1A*	12/11/80	T3S, R63E, NE 1/4 Sec. 15, NW 1/4 Sec. 14	#30	Pahroc Spring
MX-181-3/2	10/04/80	T3S, R63E, SW 1/4 Sec. 12	#30	Pahroc Spring NE
MX-181-3/3	10/04/80	T3S, R63E, NE 1/4 Sec. 12, SE 1/4 Sec. 1	#30	Pahroc Spring NE
MX-181-3/4	10/06/80	T3S, R64E, SE 1/4 Sec. 6, NE 1/4 Sec. 7	#31	Pahroc Spring NE
MX-181-3/5	10/04/80	T3S, R63E, NE 1/4 Sec. 2	#30	Pahroc Spring
MX-181-3/5A*	12/11/80	T3S, R63E, NE 1/4 Sec. 14, SW 1/4 Sec. 13,	#30	Pahroc Spring
MX-181-3/6	10/05/80	T2S, R63E, NE 1/4 and SE 1/4 Sec. 36	#27	Pahroc Spring NE
MX-181-3/7	10/05/80	T2S, R63E, SE 1/4 Sec. 26, SW 1/4 Sec. 25	#27	Pahroc Spring
MX-181-3/8		T2S, R63E, SW 1/4 Sec. 24	#27	Wheatgrass Spring
MX-181-3/9	10/07/80	T2S, R63E, NW 1/4 and NE 1/4 Sec. 23	#27	Wheatgrass Spring
MX-181-3/10	10/07/80	T2S, R63E, NE 1/4 Sec. 14	#27	Wheatgrass Spring
MX-181-3/11	10/06/80	T2S, R64E, SE 1/4 Sec. 18	#28	Deadman Spring SE
MX-181-3/12	10/06/80	T2S, R64E, SW 1/4 Sec. 7	#24	Deadman Spring SE
MX-181-3/13	10/03/80	T1S, R63E, SW 1/4 Sec. 35	#23	Wheatgrass Spring
MX-181-3/14	10/06/80	T2S, R63E, NE 1/4 Sec. 11, SE 1/4 Sec. 2	#23	Wheatgrass Spring
MX-181-3/14A*	11/17/80	T2S, R63E, NE 1/4 Sec. 11	#23	Wheatgrass Spring
MX-181-3/15	10/07/80	T2S, R64E, SE 1/4 Sec. 6	#24	Deadman Spring SE
MX-181-3/16	10/07/80	T2S, R63E, NE 1/4 Sec. 1 T2S, R64E, NW 1/4 Sec. 6	#23 & #24	Deadman Spring SE
MX-181-3/17	10/07/80	T2S, R64E, SE 1/4 Sec. 5	#24	Wheatgrass Spring
MX-181-3/18	10/07/80	T1S, R64E, NW 1/4 Sec. 31	#24	Deadman Spring SE
MX-181-3/19	10/07/80	T1S, R64E, SE 1/4 Sec. 32, SW 1/4 Sec. 33	#24	Deadman Spring SE
MX-181-3/20	10/07/80	T1S, R64E, NW 1/4 Sec. 32	#24	Deadman Spring SE
MX-181-3/21	10/07/80	T1S, R64E, NE 1/4 Sec. 29	#24	Deadman Spring SE
MX-181-3/22	10/13/80	T1S, R64E, NE 1/4 Sec. 19	#19	Deadman Spring SE
MX-181-3/23	10/07/80	T1S, R64E, NW 1/4 and SW 1/4 Sec. 17	#19	Deadman Spring SE

TABLE F-4

Shelter Summary Table

DRY LAKE VALLEY

Cluster 4

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-4/1	10/14/80	T2S, R64E, NW 1/4 Sec. 24 NE 1/4 Sec. 23	#29	Deadman Spring SE
MX-181-4/1A*	11/17/80	T2S, R64E, NE 1/4 Sec. 23	#29	Deadman Spring SE
MX-181-4/2	10/14/80	T2S, R64E, NW 1/4 Sec. 14	#29	Deadman Spring SE
MX-181-4/2A	11/17/80	T2S, R64E, NW 1/4 Sec. 14	#29	Deadman Spring SE
MX-181-4/3	10/14/80	T2S, R64E, NE & SE 1/4 Sec. 11	#25	Deadman Spring SE
MX-181-4/3A	11/17/80	T2S, R64E, NE 1/4 Sec. 11	#25	Deadman Spring SE
MX-181-4/4	10/14/80	T2S, R64E, NE 1/2 Sec. 12	#25	Deadman Spring SE
MX-181-4/4A	11/20/80	T2S, R64E, NE 1/4 Sec. 12	#25	Deadman Spring SE
MX-181-4/5	10/15/80	T2S, R65E, NW 1/4 Sec. 6	#25	The Bluffs
MX-181-4/6	10/17/80	T1S, R64E, NW 1/4 Sec. 34, NE 1/4 Sec. 33	#24	Deadman Spring SE
MX-181-4/7	10/17/80	T1S, R64E, NE 1/4 Sec. 34, SE 1/4 Sec. 27, NW 1/4 Sec. 35	#24 & #25	Deadman Spring SE
MX-181-4/8	10/14/80	T1S, R64E, SE 1/4 Sec. 35	#25	Deadman Spring SE
MX-181-4/9	10/15/80	T1S, R64E, SW and SE 1/4 Sec. 36	#25	Deadman Spring SE
MX-181-4/10	10/17/80	T1S, R64E, NE 1/4 and SE 1/4 Sec. 21	#20	Deadman Spring SE
MX-181-4/11	10/17/80	T1S, R64E, NW 1/4 Sec. 26	#25	Deadman Spring SE
MX-181-4/12	10/15/80	T1S, R64E, SE 1/4 Sec. 25 T1S, R65E, SW 1/4 Sec. 30	#25	Deadman Spring SE
MX-181-4/13	10/16/80	T1S, R64E, NE 1/4 Sec. 22	#20	Deadman Spring SE
MX-181-4/14	10/16/80	T1S, R64E, NW 1/4 Sec. 25, SW 1/4 Sec. 24	#20 & #25	Deadman Spring SE
MX-181-4/15	10/15/80	T1S, R65E, SE 1/4 Sec. 30	#25	Deadman Spring SE
MX-181-4/16	10/16/80	T1S, R64E, NW 1/4 Sec. 14	#20	Deadman Spring SE
MX-181-4/17	10/16/80	T1S, R64E, NE 1/4 Sec. 24	#20	Deadman Spring SE
MX-181-4/18	10/17/80	T1S, R64E, SE 1/4 Sec. 16	#20	Deadman Spring SE
MX-181-4/19	10/16/80	T1S, R64E, NW 1/4 Sec. 13	#20	Deadman Spring SE
MX-181-4/20	10/16/80	T1S, R65E, SE 1/4 Sec. 18, NE 1/4 Sec. 19	#21	The Bluffs
MX-181-4/21	10/18/80	T1S, R64E, SE 1/4 Sec. 3, SW 1/4 Sec. 2	#20	Deadman Spring NE
MX-181-4/22	10/18/80	T1S, R64E, NE 1/4 Sec. 12	#20	Deadman Spring NE
MX-181-4/22A	11/18/80	T1S, R64E, NE 1/4 Sec. 12	#20	Deadman Spring NE
MX-181-4/23		T1S, R64E, SE 1/4 Sec. 2,	#20	Deadman Spring NE

TABLE F-5

Shelter Summary Table

DRY LAKE VALLEY

Cluster 5

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-5/1	10/19/80	T1N, R64E, SW 1/4 Sec. 26	#17	Deadman Spring NE
MX-181-5/2	10/19/80	T1N, R64E, NE 1/4 and SE 1/4 Sec. 35	#17	Deadman Spring NE
MX-181-5/3	10/19/80	T1N, R64E, NE 1/4 Sec. 36	#17	Ely Spring
MX-181-5/4	10/18/80	T1N, R65E, SW 1/4 and SE 1/4 Sec. 31	#18	Ely Spring
MX-181-5/5	10/19/80	T1S, R65E, NE 1/4 and NW 1/4 Sec. 7	#21	Ely Spring
MX-181-5/5A*	11/18/80	T1S, R65E, NE 1/4 Sec. 7	#21	Ely Spring
MX-181-5/6	10/18/80	T1S, R65E, NW 1/4 Sec. 17	#21	The Bluffs
MX-181-5/7	10/17/80	T1S, R65E, SW 1/4 Sec. 3	#21	Ely Spring
MX-181-5/8	10/17/80	T1S, R65E, SE 1/4 and SW 1/4 Sec. 4 SW 1/4 Sec. 9	#21	Ely Spring
MX-181-5/9	10/18/80	T1S, R65E, SE 1/4 Sec. 9, SW 1/4 Sec. 8	#21	The Bluffs
MX-181-5/9A*	12/12/80	T1S, R65E, SW 1/4 Sec. 9, SE 1/4 Sec. 8	#21	The Bluffs
MX-181-5/10	10/18/80	T1S, R65E, SE 1/4 Sec. 16	#21	The Bluffs
MX-181-5/11	10/16/80	T1S, R65E, SE 1/4 Sec. 15	#21	The Bluffs
MX-181-5/12	10/18/80	T1S, R65E, NW 1/4 Sec. 23	#22	The Bluffs
MX-181-5/12A*	12/12/80	T1S, R65E, NW 1/4 Sec. 23	#22	The Bluffs
MX-181-5/13	10/18/80	T1S, R65E, SW 1/4 Sec. 21	#21	The Bluffs
MX-181-5/14	10/16/80	T1S, R65E, NE 1/4 and SE 1/4 Sec. 28	#26	The Bluffs
MX-181-5/15	10/16/80	T1S, R65E, NE 1/4 Sec. 27 NW 1/4 Sec. 26	#26	The Bluffs
MX-181-5/16	10/16/80	T1S, R65E, NW 1/4 and SW 1/4 Sec. 33	#26	The Bluffs
MX-181-5/17	10/15/80	T2S, R65E, SE 1/4 Sec. 2	#26	The Bluffs
MX-181-5/18	10/15/80	T2S, R65E, NW 1/4 Sec. 2 T1S, R65E, SW 1/4 Sec. 35	#26	The Bluffs
MX-181-5/18A*	11/20/80	T2S, R65E, NW 1/4 Sec. 2 T1S, R65E, SW 1/4 Sec. 35	#26	The Bluffs
MX-181-5/19	10/15/80	T1S, R65E, NE 1/4 and NW 1/4 Sec. 35	#26	The Bluffs
MX-181-5/19A*	12/12/80	T1S, R65E, NE 1/4 Sec. 35	#26	The Bluffs
MX-181-5/20	10/16/80	T1S, R65E, SE 1/4 Sec. 25	#26	The Bluffs
MX-181-5/20A*	12/12/80	T1S, R65E, SE 1/4 Sec. 25	#26	The Bluffs
MX-181-5/21	10/17/80	T1S, R65E, NW 1/4 Sec. 24	#22	The Bluffs
MX-181-5/22	10/17/80	T1S, R65E, NE 1/4 Sec. 13	#22	The Bluffs
MX-181-5/22A	12/13/80	T1S, R65E, NE 1/4 Sec. 13	#22	The Bluffs
MX-181-5/23	10/17/80	T1S, R66E, NW 1/4 Sec. 7 T1S, R65E, NE 1/4 Sec. 12	#22	Ely Springs

TABLE F-6

Shelter Summary Table

DRY LAKE VALLEY

Cluster 6

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-6/1	10/20/80	T1S, R63E, NE 1/4 Sec. 34	#23	Wheatgrass Spring
MX-181-6/1A*	11/17/80	T1S, R63E, NE 1/4 Sec. 34	#23	Wheatgrass Spring
MX-181-6/1B*	11/17/80	T1S, R63E, NE 1/4 Sec. 34, SE 1/4 Sec. 27	#23	Wheatgrass Spring
MX-181-6/1C*	12/12/80	T1S, R63E, NE 1/4 Sec. 34, SE 1/4 Sec. 27	#23	Wheatgrass Spring
MX-181-6/2	10/20/80	T1S, R63E, SE 1/4 Sec. 26	#23	Wheatgrass Spring
MX-181-6/2A*	12/12/80	T1S, R63E, SE 1/4 and NE 1/4 Sec. 26	#23	Wheatgrass Spring
MX-181-6/3	10/20/80	T1S, R63E, NE 1/4 and SE 1/4 Sec. 25	#23	Deadman Spring SE
MX-181-6/4	10/20/80	T1S, R63E, NE 1/4 Sec. 24	#19	Deadman Spring SE
MX-181-6/5	10/19/80	T1S, R63E, SW 1/4 Sec. 13	#19	Deadman Spring SE
MX-181-6/6	10/19/80	T1S, R63E, SE 1/4 Sec. 12	#19	Deadman Spring SE
MX-181-6/7	10/19/80	T1S, R63E, NE 1/4 Sec. 11	#19	Deadman Spring NE
MX-181-6/8	10/19/80	T1S, R64E, SE 1/4 Sec. 7	#19	Deadman Spring SE & NE
MX-181-6/9	10/20/80	T1S, R64E, SW 1/4 Sec. 5, SE 1/4 Sec. 6	#19	Deadman Spring NE
MX-181-6/10	10/20/80	T1N, R63E, SE 1/4 Sec. 36	#16	Deadman Spring NE
MX-181-6/11	10/20/80	T1N, R64E, SW 1/4 Sec. 30	#16	Deadman Spring NE
MX-181-6/12	10/20/80	T1N, R64E, SW 1/4 Sec. 29	#16	Deadman Spring NE
MX-181-6/13	10/20/80	T1N, R64E, SE 1/4 Sec. 20	#16	Deadman Spring NE
MX-181-6/14	10/20/80	T1N, R64E, NE 1/4 Sec. 19, NW 1/4 Sec. 20	#16	Deadman Spring NE
MX-181-6/14A*	11/17/80	T1N, R64E, NE 1/4 Sec. 19, NW 1/4 Sec. 20	#16	Deadman Spring NE
MX-181-6/15	10/20/80	T1N, R64E, NW 1/4 Sec. 17	#16	Deadman Spring NE
MX-181-6/16	10/21/80	T1N, R64E, NE 1/4 Sec. 7	#12	Deadman Spring NE
MX-181-6/17	10/21/80	T1N, R63E, SE 1/4 Sec. 12	#12	Deadman Spring NE
MX-181-6/18	10/21/80	T1N, R64E, NW 1/4 and SW 1/4 Sec. 5	#12	Deadman Spring NE
MX-181-6/18A*	11/17/80	T1N, R64E, NW 1/4 and SW 1/4 Sec. 5 NE 1/4 and SE 1/4 Sec. 6	#12	Deadman Spring NE
MX-181-6/19	11/1/80	T2N, R64E, SW 1/4 and SE 1/4 Sec. 31	#12	Deadman Spring NE
MX-181-6/20	10/21/80	T2N, R64E, SE 1/4 Sec. 30	#12	Coyote Spring
MX-181-6/21	10/21/80	T2N, R64E, SE 1/4 Sec. 29	#12	Coyote Spring
MX-181-6/22	10/21/80	T2N, R64E, SW 1/4 Sec. 21	#9	Coyote Spring
MX-181-6/23	10/21/80	T2N, R64E, NE 1/4 Sec. 20 SE 1/4 Sec. 17	#8	Coyote Spring

TABLE F-7

Shelter Summary Table

DRY LAKE VALLEY

Cluster 7

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	Map References U.S.G.S.
MX-181-7/1	10/29/80	T1S, R64E, NW 1/4 Sec. 16	#20	Deadman Spring SE
MX-181-7/2	10/29/80	T1S, R64E, NE 1/4 Sec. 9	#20	Deadman Spring NE
MX-181-7/3	10/29/80	T1S, R64E, SW 1/4 Sec. 4, SE 1/4 Sec. 32	#19 & #20	Deadman Spring NE
MX-181-7/4	10/29/80	T1N, R64E, NE 1/4 and SE 1/4 Sec. 32	#16	Deadman Spring NE
MX-181-7/5	10/29/80	T1N, R64E, NE 1/4 Sec. 33	#17	Deadman Spring NE
MX-181-7/6	10/31/80	T1N, R64E, NW 1/4 and SW 1/4 Sec. 27	#17	Deadman Spring NE
MX-181-7/7	10/31/80	T1N, R64E, SW 1/4 and SE 1/4 Sec. 21	#17	Deadman Spring NE
MX-181-7/8	10/31/80	T1N, R64E, SE 1/4 Sec. 16	#17	Deadman Spring NE
MX-181-7/9	10/31/80	T1N, R64E, SE 1/4 Sec. 15	#17	Deadman Spring NE
MX-181-7/10	10/30/80	T1N, R64E, SW 1/4 Sec. 11	#13	Deadman Spring NE
MX-181-7/11	10/30/80	T1N, R64E, NE 1/4 Sec. 10, SE 1/4 Sec. 3	#13	Deadman Spring NE
MX-181-7/12	10/30/80	T1N, R64E, NW 1/4 Sec. 2, NE 1/4 Sec. 3	#13	Deadman Spring NE
MX-181-7/13	11/02/80	T1N, R64E, NE 1/4 Sec. 2, NW 1/4 Sec. 1 T2N, R64E, SE 1/4 Sec. 35, SW 1/4 Sec. 36	#13	Deadman Spring NE
MX-181-7/14	11/02/80	T2N, R64E, NW 1/4 Sec. 36	#13	Ely Spring
MX-181-7/15	11/02/80	T2N, R64E, NE 1/4 Sec. 26	#13	Coyote Spring
MX-181-7/16	11/12/80	T2N, R64E, NW 1/4 Sec. 24	#9	Bristol Well
MX-181-7/17	11/01/80	T2N, R64E, SW 1/4 Sec. 22	#9	Coyote Spring
MX-181-7/18	11/01/80	T2N, R64E, NE 1/4 Sec. 27	#13	Coyote Spring
MX-181-7/19	11/01/80	T2N, R64E, NE and NW 1/4 Sec. 34	#13	Deadman Spring NE
MX-181-7/20	10/31/80	T2N, R64E, NW 1/4 Sec. 33	#13	Deadman Spring NE
MX-181-7/21	10/31/80	T1N, R64E, NW 1/4 Sec. 4	#13	Deadman Spring NE
MX-181-7/22	10/31/80	T1N, R64E, NE 1/4 Sec. 9	#13	Deadman Spring NE
MX-181-7/23	10/31/80	T1N, R64E, NW 1/4 Sec. 16	#17	Deadman Spring NE

TABLE F-8

Shelter Summary Table

DRY LAKE VALLEY

Cluster 8

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-8/1	10/28/80	T1N, R64E, SE 1/4 and SW 1/4 Sec. 23	#17	Deadman Spring NE
MX-181-8/2	10/28/80	T1N, R64E, SE 1/4 and SW 1/4 Sec. 24	#17	Ely Spring
MX-181-8/3	10/28/80	T1N, R65E, SW 1/4 and NW 1/4 Sec. 30 T1N, R64E, SE 1/4 Sec. 25	#18 & #17	Ely Spring
MX-181-8/4	10/29/80	T1N, R65E, SW 1/4 Sec. 29 SE 1/4 Sec. 30	#18	Ely Spring
MX-181-8/5	10/28/80	T1N, R64E, SE 1/4 Sec. 13	#17	Ely Spring
MX-181-8/6	10/28/80	T1N, R65E, SW 1/4 Sec. 20	#18	Ely Spring
MX-181-8/7	10/29/80	T1N, R64E, NW 1/4 Sec. 13	#17	Deadman Spring NE
MX-181-8/8	10/28/80	T1N, R65E, SE 1/4 Sec. 18	#18	Ely Spring
MX-181-8/9	10/29/80	T1N, R64E, NE 1/4 Sec. 12	#13	Ely Spring
MX-181-8/10	10/29/80	T1N, R65E, SW 1/4 Sec. 8	#14	Ely Spring
MX-181-8/11	10/29/80	T1N, R65E, SE 1/4 Sec. 6 NE 1/4 Sec. 7	#14	Ely Spring
MX-181-8/12	10/29/80	T1N, R65E, NE 1/4 Sec. 8, NW 1/4 Sec. 9	#14	Ely Spring
MX-181-8/13	10/31/80	T1N, R65E, NE 1/4 Sec. 6	#14	Ely Spring
MX-181-8/14	10/30/80	T1N, R65E, NE 1/4 Sec. 5 T2N, R65E, SE 1/4 Sec. 32	#14	Ely Spring
MX-181-8/15	10/30/80	T2N, R65E, NW 1/4 Sec. 31	#14	Ely Spring
MX-181-8/16	11/04/80	T2N, R65E, SW 1/4 Sec. 27	#14	Bristol Well
MX-181-8/17	11/04/80	T2N, R65E, SW 1/4 Sec. 22	#10	Bristol Well
MX-181-8/18	11/04/80	T2N, R65E, SW 1/4 Sec. 23	#11	Bristol Well
MX-181-8/18A*	12/13/80	T2N, R65E, SW 1/4 Sec. 23	#11	Bristol Well
MX-181-8/19	11/04/80	T2N, R65E, SE 1/4 Sec. 14	#11	Bristol Well
MX-181-8/19A*	11/20/80	T2N, R65E, SE 1/4 Sec. 14	#11	Bristol Well
MX-181-8/20	10/30/80	T2N, R65E, SW 1/4 Sec. 35	#15	Ely Spring
MX-181-8/21	10/30/80	T1N, R65E, NE 1/4 Sec. 4	#14	Ely Spring
MX-181-8/21A*	11/18/80	T1N, R65E, NE 1/4 Sec. 4	#14	Ely Spring
MX-181-8/22	10/30/80	T1N, R65E, NE 1/4 Sec. 3	#14	Ely Spring
MX-181-8/22a	11/18/80	T1N, R65E, NE 1/4 &		
MX-181-8/23	11/04/80	T2N, R65E, NE 1/4 Sec. 15	#10	Bristol Well

TABLE F-9

Shelter Summary Table

DRY LAKE VALLEY

Cluster 9

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-9/1	10/31/80	T2N, R65E, NE 1/4 Sec. 29	#14	Bristol Well
MX-181-9/2	10/30/80	T2N, R65E, NE 1/4 Sec. 30	#14	Bristol Well
MX-181-9/3	10/30/80	T2N, R65E, NW 1/4 Sec. 19	#10	Bristol Well
MX-181-9/4	10/31/80	T2N, R65E, NE 1/4 Sec. 18	#10	Bristol Well
MX-181-9/5	10/31/80	T2N, R65E, SW 1/4 Sec. 7 T2N, R64E, SE 1/4 Sec. 12	#9 & #10	Bristol Well
MX-181-9/6	11/01/80	T2N, R64E, SE 1/4 Sec. 11, SW 1/4 Sec. 12	#9	Coyote Spring
MX-181-9/7	11/01/80	T2N, R64E, SW 1/4 Sec. 2	#9	Coyote Spring
MX-181-9/8	11/01/80	T2N, R64E, NE 1/4 Sec. 2	#9	Coyote Spring
MX-181-9/9	11/11/80	T3N, R64E, NW 1/4 Sec. 35	#5	Coyote Spring
MX-181-9/10	11/11/80	T3N, R64E, NW 1/4 Sec. 34	#5	Coyote Spring
MX-181-9/11	11/11/80	T3N, R64E, SE 1/4 and SW 1/4 Sec. 28	#5	Coyote Spring
MX-181-9/12	11/11/80	T3N, R64E, SE 1/4 Sec. 21	#5	Coyote Spring
MX-181-9/13	11/11/80	T3N, R64E, SW 1/4 Sec. 16	#5	Coyote Spring
MX-181-9/14	11/11/80	T3N, R64E, NE 1/4 Sec. 16 SE 1/4 Sec. 9	#2 & #5	Bailey Wash
MX-181-9/15	11/11/80	T3N, R64E, SE 1/4 Sec. 10	#2	Bailey Wash
MX-181-9/16	11/12/80	T3N, R64E, SW 1/4 Sec. 14	#5	Coyote Spring
MX-181-9/17	11/03/80	T3N, R64E, SE 1/4 Sec. 22	#5	Coyote Spring
MX-181-9/18	11/03/80	T3N, R64E, NE 1/4 and NW 1/4 Sec. 26	#5	Coyote Spring
MX-181-9/19	11/12/80	T3N, R64E, NE 1/4 and NW 1/4 Sec. 25	#5	Bristol Well
MX-181-9/20	11/01/80	T3N, R65E, SW 1/4 Sec. 30	#6	Bristol Well
MX-181-9/21	11/01/80	T3N, R64E, SE 1/4 Sec. 36	#5	Bristol Well
MX-181-9/22	10/31/80	T2N, R65E, SW 1/4 Sec. 6	#10	Bristol Well
MX-181-9/23	10/31/80	T2N, R65E, SW 1/4 and SE 1/4 Sec. 17	#10	Bristol Well
MX-181-9/23A*	11/21/80	T2N, R65E SE 1/4 Sec. 17	#10	Bristol Well

TABLE F-10

Shelter Summary Table

DRY LAKE VALLEY

Cluster 10

Sample Unit No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-10/1	11/01/80	T2N, R64E, SE 1/4 Sec. 14	#9	Coyote Spring
MX-181-10/2	11/01/80	T2N, R64E, SE 1/4 Sec. 15	#9	Coyote Spring
MX-181-10/3	11/01/80	T2N, R64E, SE 1/4 Sec. 9, SW 1/4 Sec. 10	#9	Coyote Spring
MX-181-10/4	11/12/80	T2N, R64E, NW 1/4 Sec. 16 NE 1/4 Sec. 17	#8 &#9	Coyote Spring
MX-181-10/5	11/12/80	T2N, R63E, SW 1/4 Sec. 12	#8	Coyote Spring
MX-181-10/6	11/12/80	T2N, R64E, SW 1/4 Sec. 7	#8	Coyote Spring
MX-181-10/7	11/13/80	T2N, R64E, NW 1/4 Sec. 8	#8	Coyote Spring
MX-181-10/8	11/03/80	T2N, R64E, SE 1/4 Sec. 4	#9	Coyote Spring
MX-181-10/9	11/12/80	T2N, R63E, SE 1/4 Sec. 1	#8	Coyote Spring
MX-181-10/10	11/13/80	T2N, R64E, NE 1/4 Sec. 5	#8	Coyote Spring
MX-181-10/11	11/13/80	T3N, R64E, SW 1/4 Sec. 32	#4	Coyote Spring
MX-181-10/12	11/13/80	T3N, R64E, SE 1/4 and SW 1/4 Sec. 29	#4	Coyote Spring
MX-181-10/12A*	12/13/80	T3N, R64E, SE 1/4 and SW 1/4 Sec. 29	#4	Coyote Spring
MX-181-10/13	11/13/80	T3N, R64E, SE 1/4 Sec. 19 NE 1/4 Sec. 30	#4	Coyote Spring
MX-181-10/14	11/03/80	T3N, R63E, NE 1/4 Sec. 26	#4	Coyote Spring
MX-181-10/15	11/03/80	T3N, R63E, NE 1/4 Sec. 25	#4	Coyote Spring
MX-181-10/16	11/03/80	T3N, R63E, NW 1/4 Sec. 24	#4	Coyote Spring
MX-181-10/16A*	11/21/80	T3N, R63E, NW 1/4 Sec. 24	#4	Coyote Spring
MX-181-10/17	11/03/80	T3N, R63E, SE 1/4 and NE 1/4 Sec. 13	#4	Coyote Spring
MX-181-10/18	11/13/80	T3N, R64E, NE 1/4 and NW 1/4 Sec. 18	#4	Coyote Spring
MX-181-10/19	11/13/80	T3N, R63E, SE 1/4 Sec. 11	#1	Bailey Wash
MX-181-10/20	11/13/80	T3N, R64E, NW 1/4 and SW 1/4 Sec. 6	#1	Bailey Wash
MX-181-10/21	11/13/80	T4N, R63E, SW 1/4 Sec. 36	#1	Bailey Wash
MX-181-10/22	11/13/80	T3N, R63E, NW 1/4 Sec. 11	#1	Silver King Mtn.
MX-181-10/23	11/13/80	T3N, R63E, NW 1/4 Sec. 2	#1	Silver King Mtn.

TABLE F-11

Shelter Summary Table

DRY LAKE VALLEY

RSS No.	Date Surveyed	Legal Description	Map References 1:9600	U.S.G.S.
MX-181-RSS/1	11/11/80	T3S, R64E, NE 1/4 Sec. 9	#31	Pahroc Spring NE
MX-181-RSS/2	11/11/80	T1S, R64E, NW 1/4 Sec. 19	#19	Deadman Spring SE
MX-181-RSS/3	11/11/80	T1S, R65E, NW 1/4 Sec. 19	#21	The Bluffs
MX-181-RSS/4	11/11/80	T1N, R65E, NW 1/4 and SW 1/4 Sec. 6	#14	Ely Springs
MX-181-RSS/5	11/11/80	T2N, R64E, NW 1/4 Sec. 16	#9	Coyote Spring
CMF No.				
MX-181-CMF/1	10/19/80	T3S, R64E, SE 1/4 Sec. 8, SW 1/4 Sec. 9	#31	Pahroc Spring NE
MX-181-CMF/2	11/04/80	T3S, R64E, NW 1/4 Sec. 13, NE 1/4 Sec. 14	#32	Pahroc Spring NE
MX-181-CMF/3	11/13/80	T2S, R64E, NW 1/4 and SW 1/4 Sec. 7	#24	Deadman Spring SE
MX-181-CMF/4	11/04/80	T1S, R64E, SW 1/4 Sec. 23	#20	Deadman Spring SE
MX-181-CMF/5	11/03/80	T1S, R65E, SW 1/4 Sec. 16, NW 1/4 Sec. 21	#21	The Bluffs
MX-181-CMF/6	11/03/80	T1N, R63E, SW 1/4 Sec. 31	#16	Deadman Spring NE
MX-181-CMF/7	11/13/80	T1N, R64E, NW 1/4 Sec. 11	#13	Deadman Spring NE
MX-181-CMF/8	11/04/80	T1N, R65E, NE 1/4 and NW 1/4 Sec. 5	#14	Ely Spring
MX-181-CMF/8A	11/20/80	T1N, R65E, NE 1/4 and NW 1/4 Sec. 5	#14	Ely Spring
MX-181-CMF/9	11/12/80	T2N, R64E, NW 1/4 and SE 1/4 Sec. 2	#9	Coyote Spring
MX-181-CMF/10	11/04/80	T2N, R64E, NW 1/4 Sec. 5	#8	Coyote Spring

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APPENDIX G

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APPENDIX H

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APPENDIX I

VEGETATIVE MAP


A1
A2
A3
A4
C1
C2
C3
C4
C5
C9
C12
C13
C16
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C18
C20
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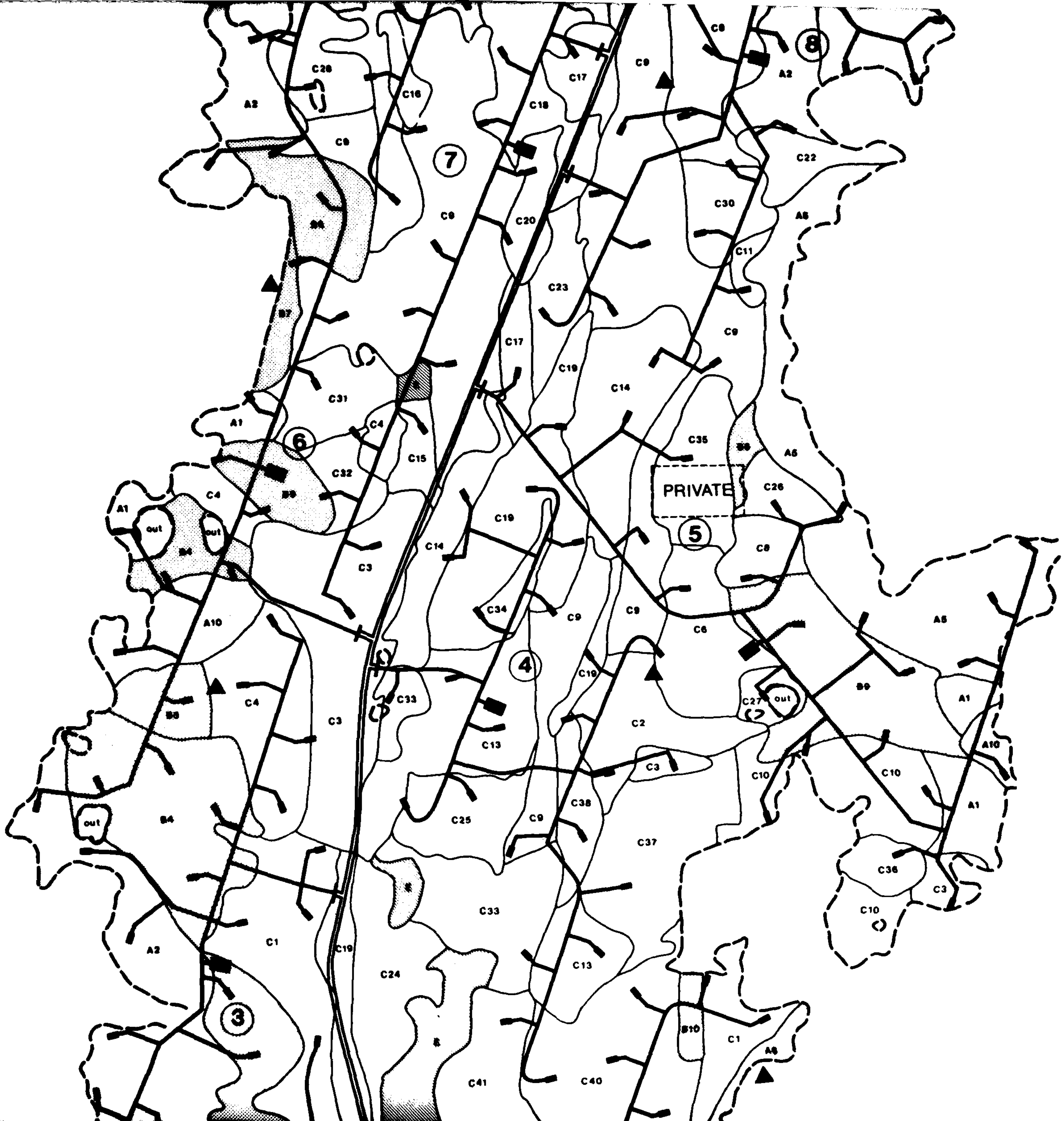
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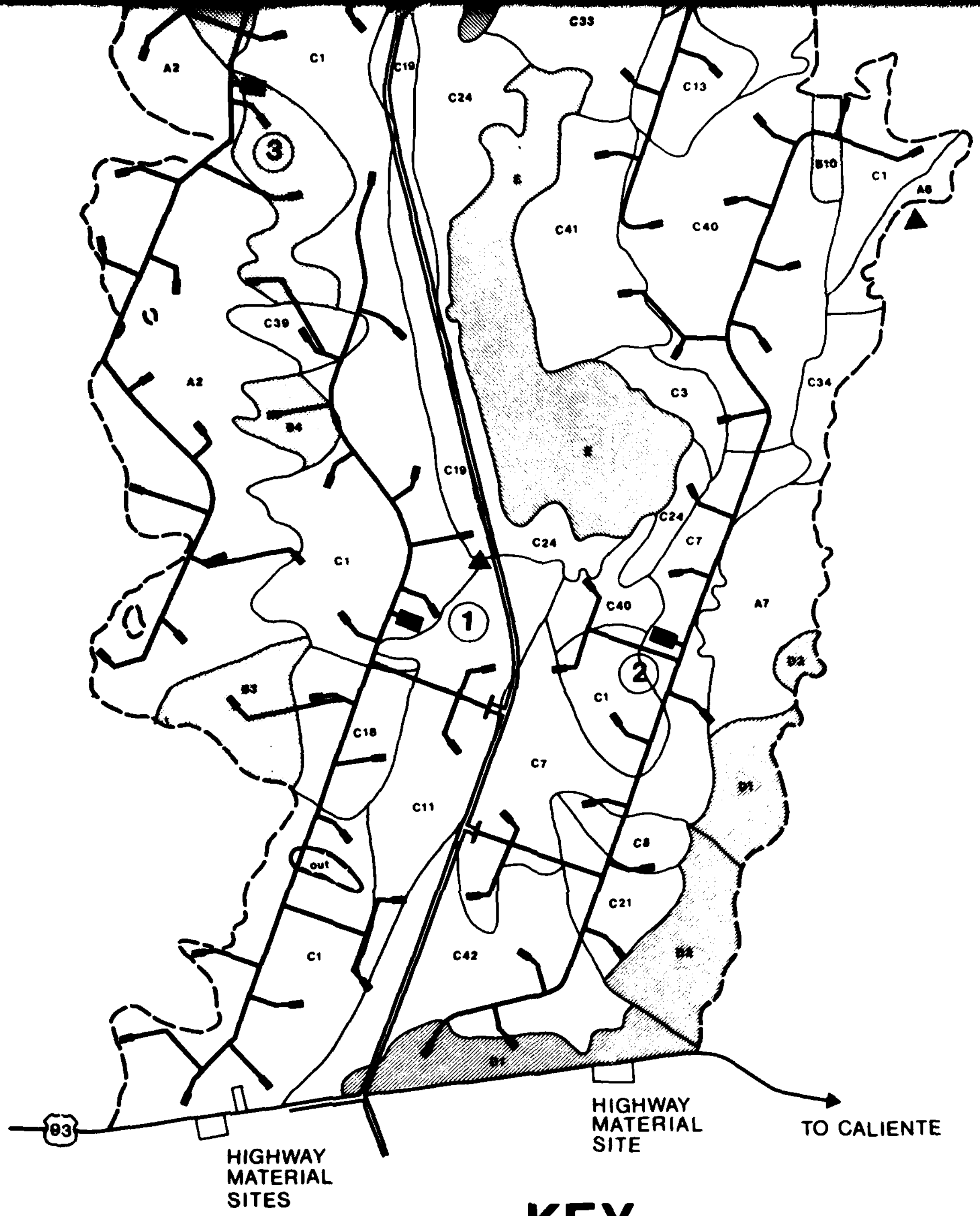

KEY

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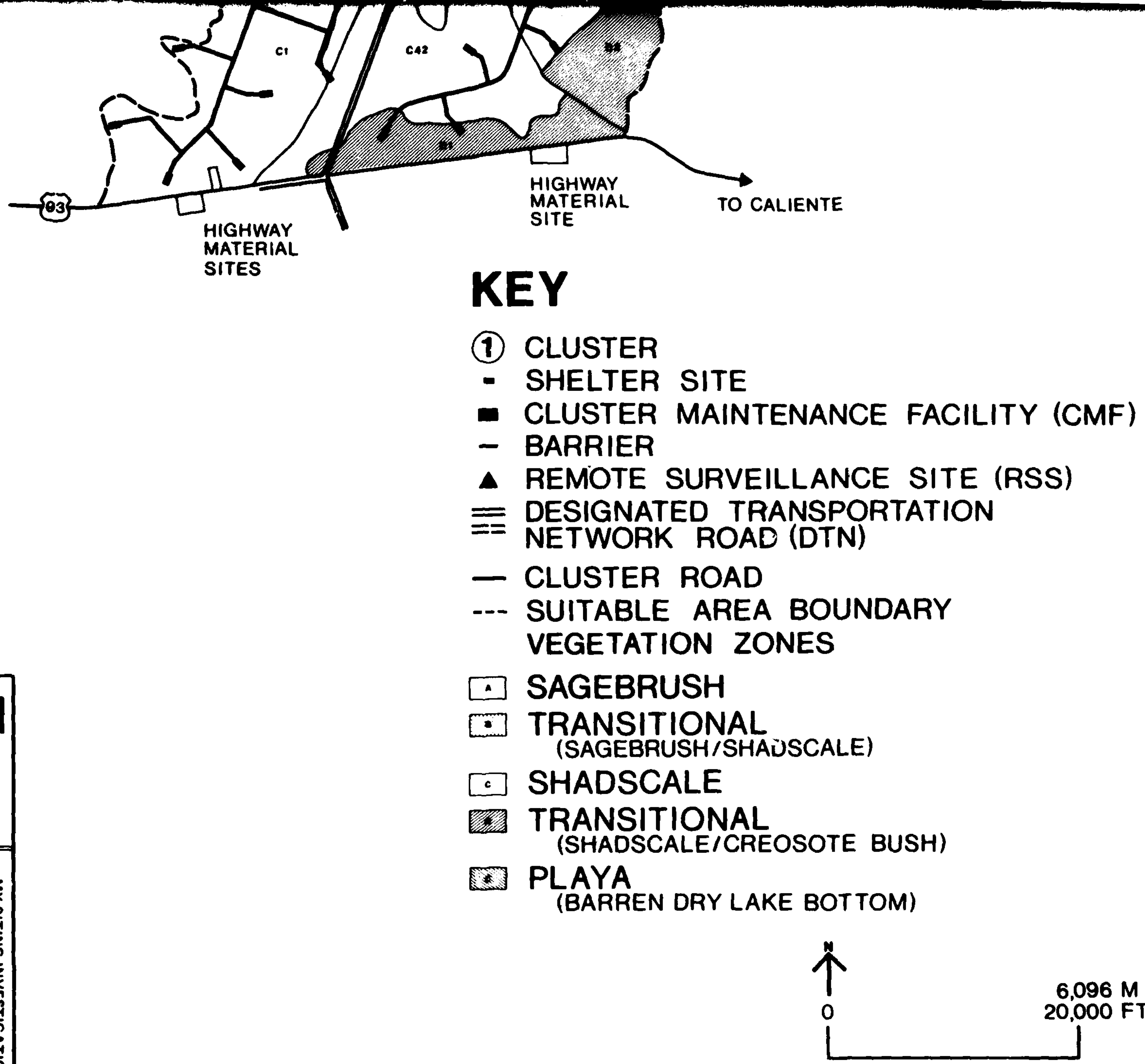
▪ SHELTER SITE
■ CLUSTER MAINTENANCE FACILITY (CMF)



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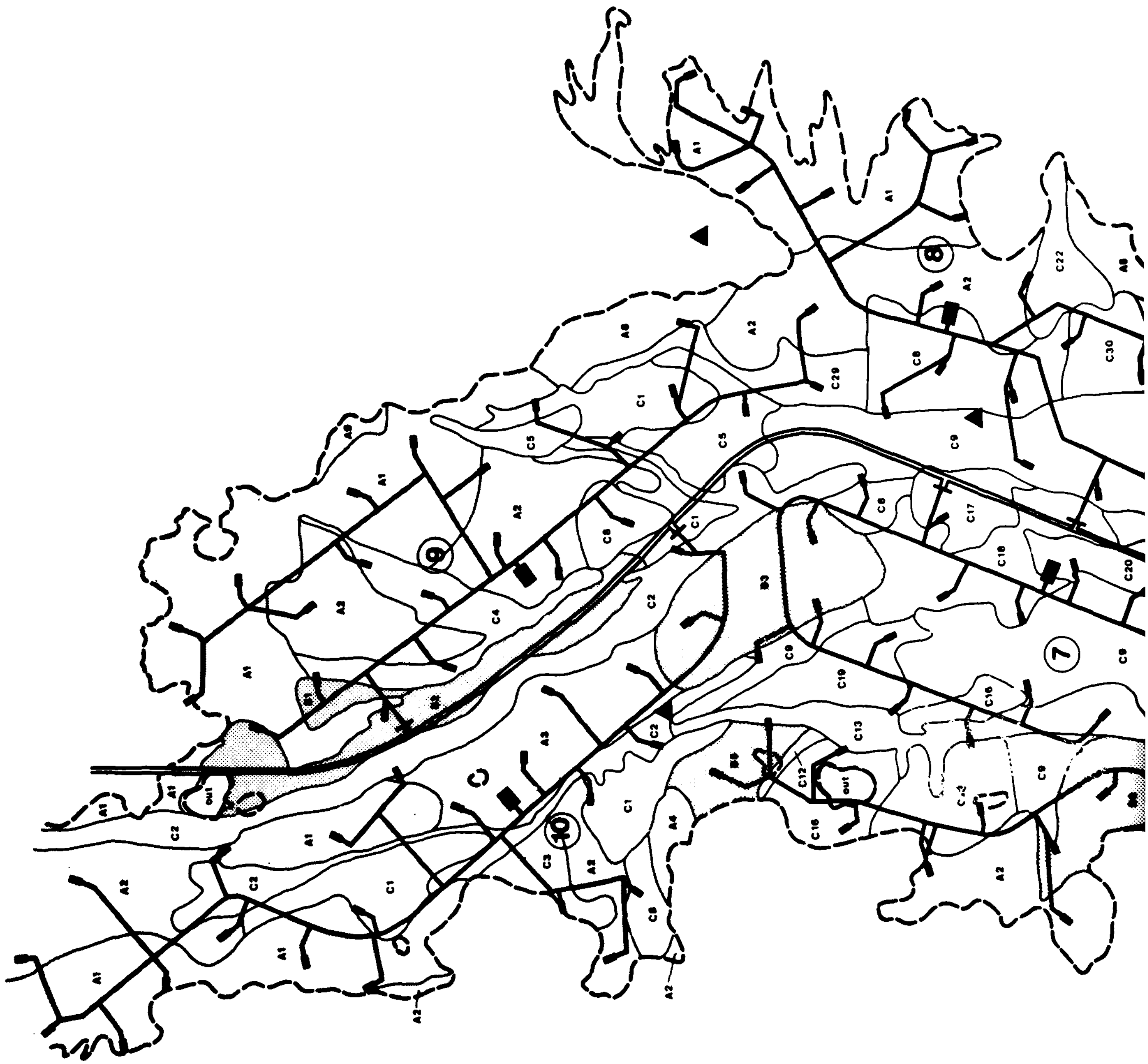
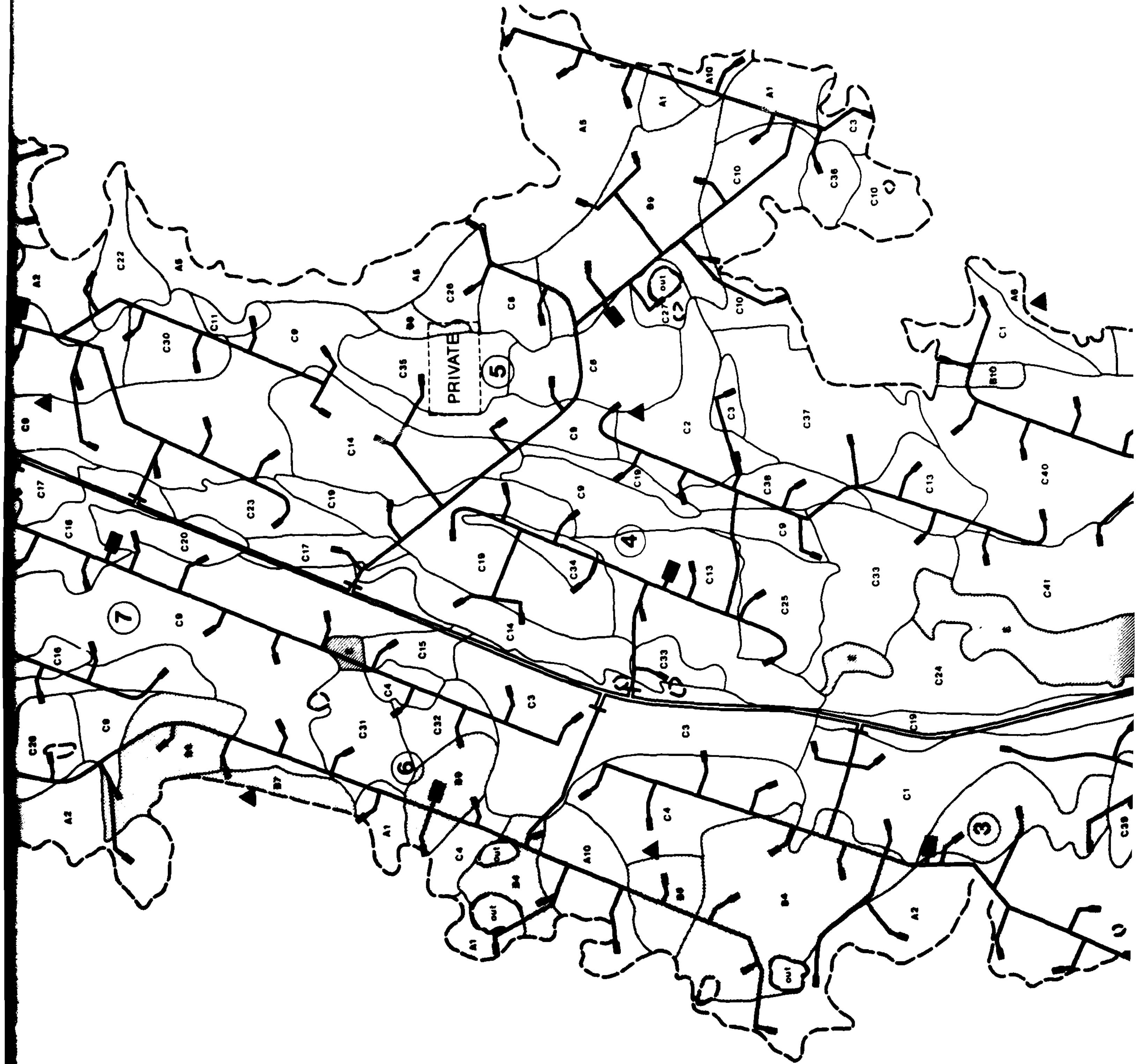
DEPARTMENT OF THE AIR FORCE
BMO/AFRCE-MX

DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN DRY LAKE VALLEY

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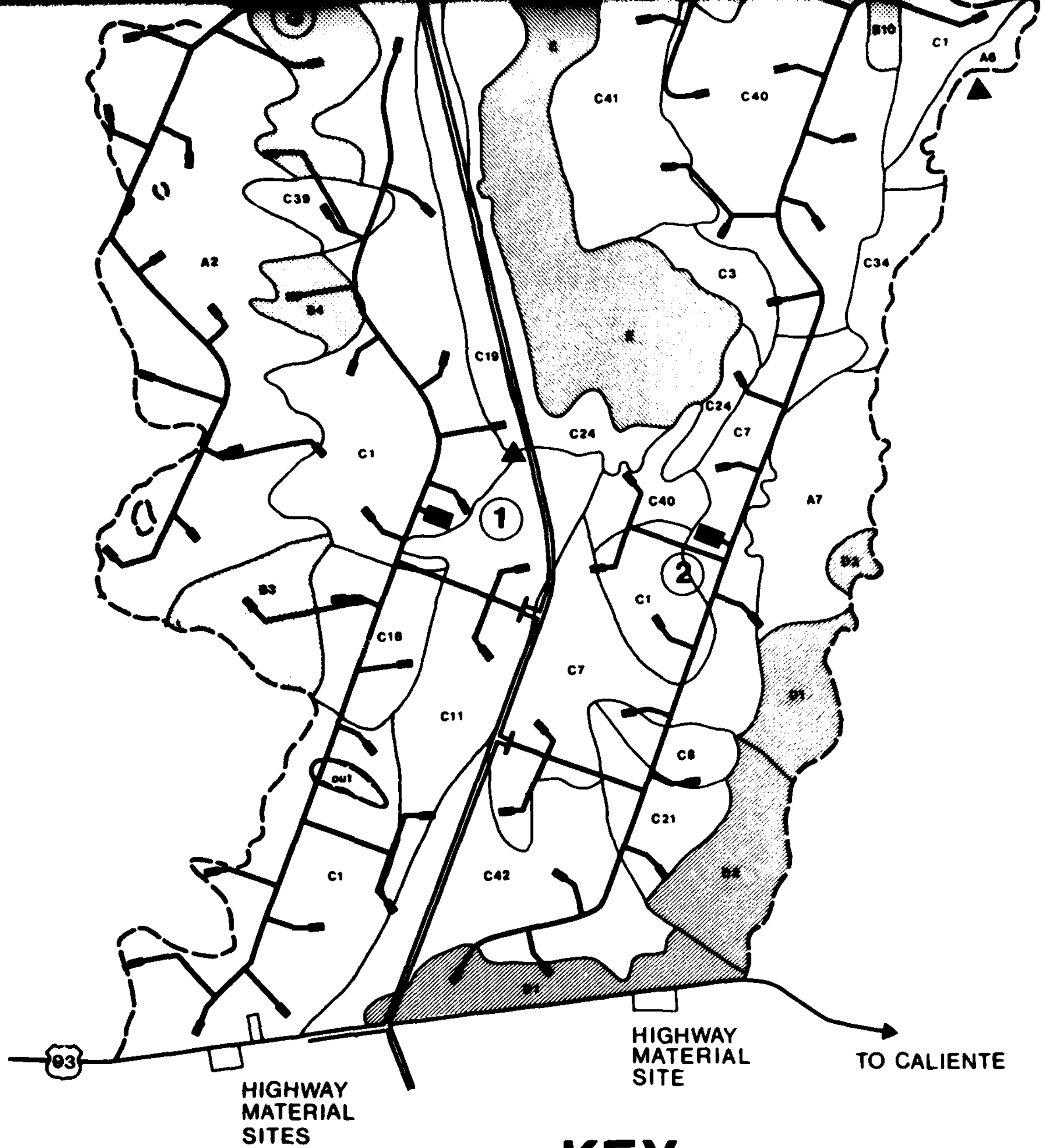

KEY

① CLUSTER
▪ SHELTER SITE
■ CLUSTER MAINTENANCE FACILITY (CMF)
– BARRIER
▲ REMOTE SURVEILLANCE SITE (RSS)
≡ DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)

KEY

- ① CLUSTER
- SHELTER SITE
- CLUSTER MAINTENANCE FACILITY (CMF)
- BARRIER
- REMOTE SURVEILLANCE SITE (RSS)
- DESIGNATED TRANSPORTATION NETWORK ROAD (DTN)
- CLUSTER ROAD
- SUITABLE AREA BOUNDARY

VEGETATION ZONES

- A SAGEBRUSH
- B TRANSITIONAL (SAGEBRUSH/SHADSCALE)
- C SHADSCALE
- D TRANSITIONAL (SHADSCALE/CREOSOTE BUSH)
- E PLAYA (BARREN DRY LAKE BOTTOM)

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MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE
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DOMINANT/SUBDOMINANT VEGETATIVE ASSOCIATIONS IN DRY LAKE VALLEY

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